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Edited by
J. A. MALLETT

Articles which appear in the Journal may be reprinted, provided that both the Journal and the authors are acknowledged.

COVER PICTURE

"Tim" Ealey, of the C.S.I.R.O. Wildlife Section, is co-author of the article on euro control which appears in this issue. As a hobby he dabbles in oil-painting and this month's cover picture is what he describes as a surrealistic study of Pulcunnah Hill, one of the largest of many granite outcrops on Abydos Station. The hill normally shelters a large euro colony
(Reproduction by courtesy of the Claude Hotchin Galleries)

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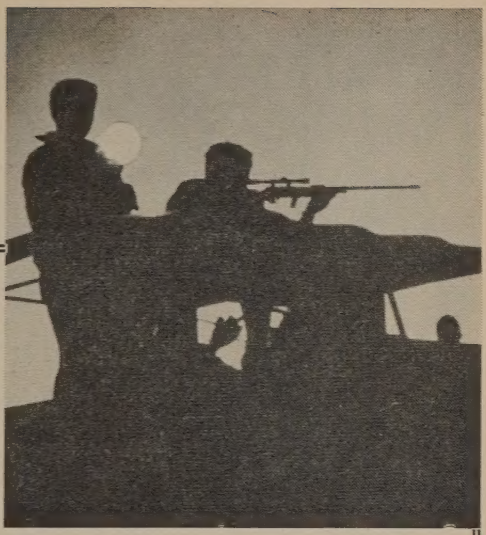


Fig. 1—Spotlight shooting. Samples of 200 female euros were shot every six months to assess the possible rate of breeding-up after poisoning

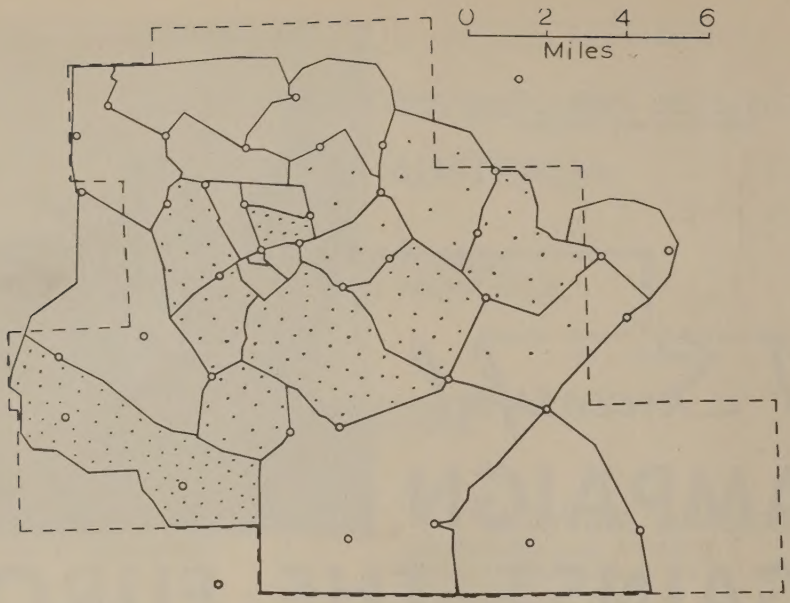
A Successful CAMPAIGN AGAINST THE EURO

By E. H. M. EALEY, Wildlife Survey Section, C.S.I.R.O., and
T. M. RICHARDSON, Pastoralist, Marble Bar

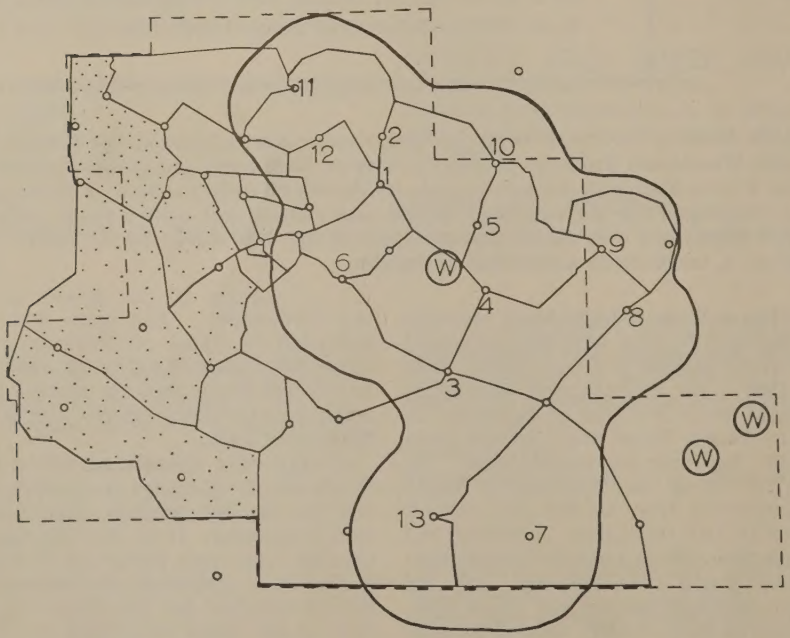
RESULTS from a five-year research programme carried out by the C.S.I.R.O. on the Abydos-Woodstock Pastoral Research Station indicated that euros could be controlled in a practical and economic way by the traditional method of water poisoning, if it was continued for an extended period and carried out over a large area. Small-scale trials supported this claim, but no opportunity had occurred to assess the practicability of a large-scale poisoning operation.

One of the authors (Richardson) recently bought Eginbah Station and later acquired the adjoining property, Talga Talga, near Marble Bar. As he intended managing Talga Talga while residing at Eginbah, he moved the Talga Talga stock to the paddocks near Eginbah for convenience. On hearing of these arrangements, Ealey wrote suggesting that he did not cut off the water in the destocked paddocks but should use them for a poisoning campaign along the lines recommended by the C.S.I.R.O. Richardson agreed to do this; and in fact he had already started poisoning at six waters on September 20, 1959. Poisoning at the remaining seven water points was started at different times during November. The area was carefully surveyed by Ealey on November 26, 1959, when the greater part of the euro kill had taken place, and the results compared with the previous survey carried out in November 1956.

A high euro density prevailed on Talga Talga despite 15 years of consistent poisoning for six-day periods during November and December. It is the prevailing local opinion that once poisoning is commenced it should be continued for six days regardless of whether hot dry days occur or not. One of the most important results of the C.S.I.R.O. investigation was the discovery that the euro population included both frequent and habitually infrequent



Shows distribution of sheep immediately after shearing which was done in May
Legend: Each dot represents 10 sheep



Stock were moved to these paddocks in September and half the station was poisoned
Legend: Each dot represents 10 sheep. The area poisoned is outlined with the thicker black line. Numbers represent waters mentioned in Table 2. W indicates the position of natural waters available to euros during poisoning.

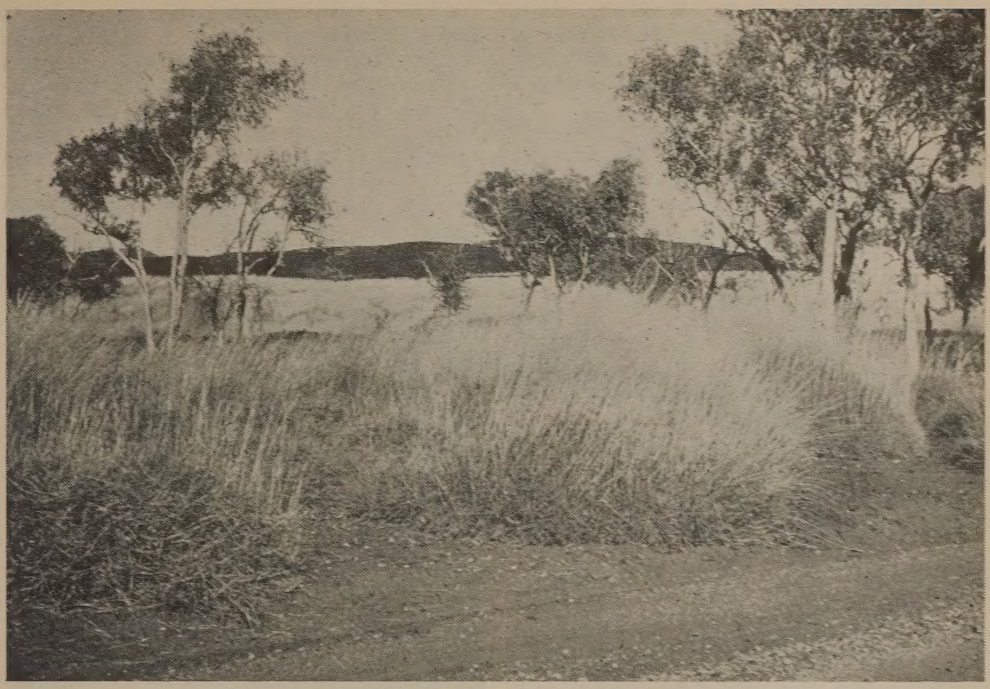


Fig. 2—In years gone by, this area was named Grassy Flat! Note the complete absence of grass and invasion by buck spinifex. Since the photograph was taken, the spinifex has been burnt and Buffel grass established

drinkers, the latter being individuals that harboured in places where they could avoid the daytime heat, such as caves in granite outcrops. The bulk of the euros coming to drink in cool weather would be the frequent drinkers, which would be poisoned in hot dry weather anyway; so it is virtually a waste of time to poison for short periods in a spell of cool weather.

The previous owner of Talga Talga had observed that, in the past, large numbers of euros could be poisoned in a six-day operation, but this was not the case in recent years, although similar poison strengths were used under similar conditions. It is possible that years of six-day poisoning may have culled out most of the frequently drinking euros, so that the bulk of the population in recent years consisted of hardier types of animals, such as are found in drier localities.

It had been pointed out to pastoralists that six days of water poisoning would make an impression on euro numbers only if carried out under ideally hot dry conditions, and if care was taken not to interfere with the animals' normal drinking habits. As this would involve an extremely tedious procedure in stocked paddocks, and weather conditions are so variable, it was recommended that poisoning be carried out over an extended period in paddocks that could be destocked as part of a deferred grazing programme. The local pastoralists expressed doubt as to the practicability of this recommendation for the following reasons:—

(1) On a run-down station, the sheep have to be spread over all the paddocks to survive a dry summer, and so paddocks cannot be destocked until after the first rain, when of course water poisoning would be useless. It was claimed that on some stations even two-thirds of the total area could not support the flock for the period between shearing and the summer rains.

(2) Even in early summer, sheep cannot be moved without fear of a loss of condition that would endanger their survival through the hot season.
(3) If the paddocks to be poisoned were left empty after shearing, or mustered in early summer, a considerable number of stragglers would inevitably remain and would be poisoned.
(4) Shorn sheep can easily get through fences; and they would make their way back to their old paddocks, break through the strand-wire fences around poisoned troughs, and drink the poisoned water.

The experience gained during the Talga Talga campaign, described below, showed that none of these objections need be accepted as valid.

Stocking Arrangements.—Talga Talga (211,000 acres, 2,300 sheep) had been run in the traditional manner with a few stock in every paddock. Soon after it was acquired by Richardson, in August 1959, all the sheep were concentrated into four paddocks (see Map), so that instead of a stocking rate of one sheep to 100 acres there was a rate of one sheep to 20 acres, despite the fact that the summer was beginning and it was a drought year (see Table 1).

It should be noted that the paddocks used during the summer (except the ewe paddock) were almost entirely spinifex paddocks. Analyses carried out by the C.S.I.R.O. have indicated that young spinifex plants may still have a high protein content in summer, when other grasses have become dry and very low in nutritive value. This may explain why the sheep were still in excellent order when examined in late November. Both authors

Fig. 3—Weighing and measuring euros to obtain data on breeding, growth and nutrition

Table 1

TALGA TALGA RAINFALL

	1958												
	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Points	335	33	144	0	0	0	242	126	0	0	10	86	976
Number of Days	4	1	5	0	0	0	4	2	0	0	1	1	18
	1959												
Points	140	0	64	31	0	0	30	0	0	0	13	37	313
Number of Days	2	0	3	2	0	0	3	0	0	0	1	2	13

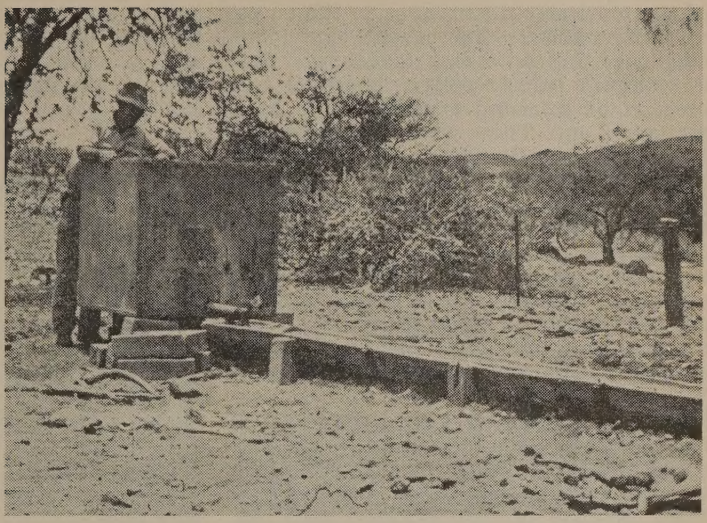


Fig. 4—Mr. Richardson checking the level of poison in a 200 gallon tank connected to a sheep trough

are convinced that when there is nothing but spinifex for the sheep to eat, there is no advantage in the practice of spreading stock over the entire station. This view is also held by H. Suijdendorp (personal communication), and is confirmed by the observations on Talga Talga.

Some of the waters to be poisoned were cut off in September; and for three weeks stragglers were caught waiting at empty troughs and transported by truck to the stocked paddocks. C.S.I.R.O. observations had indicated that it was preferable not to cut off waters before poisoning, because

Fig. 5—Dr. A. R. Main, of the Zoology Dept., University of Western Australia, weighing euro gut contents. Much of the work on euro feeding and nutrition was planned by Dr. Main

of the inevitable disturbance in the euros' drinking habits. Subsequent experience supported this contention, and showed that it was quite safe to poison the water and erect tight stranded-wire fences to keep stragglers out. These were collected when the mills were visited twice a week. Seventy stragglers were collected during the campaign: only four forced their way through the strand-wire fences and were poisoned.

Poisoning Arrangements.—The poisons used were arsenic pentoxide and sodium arsenite. The latter was prepared from arsenic trioxide (white arsenic) and soda, or purchased under the name of "Liquid Arzeen" or "Cooper's Weedicide." Cooper's Weedicide was being tested for the first time, and the dose of 6 fluid oz./40 galls., calculated by C.S.I.R.O., proved to be adequate. The other poisons were used at the strengths recommended in the Agricultural Journal of W.A. (May-June 1959, issue.)

A very important innovation suggested by the previous owner was the provision at the water points of 200-gallon tanks, fitted with ball cocks. These were filled with poisoned water, and installed at the ends of the sheep troughs. The provision of these storage tanks made it unnecessary to visit the troughs every day, which would have been impracticable anyway.

Six water points were poisoned for 68 days before the C.S.I.R.O. check-survey, six for periods of from 10-21 days, and one for seven days (see Table 2). Where warranted, poisoning was continued after the survey until it rained.

Results.—The amounts of poisoned water consumed were measured and, after allowing for evaporation, the kill was estimated on a basis of two euros per gallon. This figure is based on C.S.I.R.O. experiments, and is known to be conservative. The amounts of poisoned water used at the different water points, and the calculated number of euros killed, are given in Table 2.

Even where water had been poisoned for 68 days, occasional fresh tracks were

Table 2

POISONING RESULTS ACHIEVED BEFORE NOVEMBER 27, 1959

No. shown on Map	Name of Mill	Date Poisoning Commenced	Number of Days	Gallons Used	Evaporation*	Gallons Drunk	Euros Killed
1	No. 3	Sept. 20	68	420	180	240	480
2	Townsend	do.	68	2,000	60	1,940	3,880
3	Eastward	do.	68	150	60	90	180
4	Shallow Well	do.	68	1,350	180	1,170	2,340
5	Knob's Well	do.	68	500	60	440	880
6	13 Mile	do.	68	300	120	180	360
	(Total Euros Poisoned in Two Months						8,120
7	Dam	Nov. 6	21	1,800	1,000	800	1,600†
8	Little De Grey	do.	21	660	35	625	1,250
9	Armstrong's	Nov. 13	14	500	15	485	970
10	Andy's	do.	14	150	15	135	270
11	Gap	Nov. 17	10	200	10	190	380
12	No. 1	do.	10	120	10	110	220
13	Dyke	Nov. 20	7	200	13	187	374
	Total Euros Poisoned to November 27						11,584
	Euros Poisoned since November 27						1,250
	Euros Poisoned during whole campaign					At least	12,834

* Calculated from mean monthly evaporation figures for the Marble Bar District obtained from Meteorological Bureau.

† Poison used here was accidentally made double strength and evaporation from dam surface was high so calculated kill is very conservative.

noted which indicated that there were still some animals in the area which were drinking for the first time that summer or were moving in from outside country. Poisoning was therefore continued; but the amount of poisoned water drunk was too small to measure.

Fig. 6—A euro drinking. For efficient poisoning it is important not to interfere with their drinking habits

It was most fortunate that a trace of rain had fallen three days before the C.S.I.R.O. survey, enabling fresh tracks on the roads and euro pads to be noted. Stony roads had to be ignored in this assessment of residual euro activity, but on 13.8 miles of sandy road a total of only eight fresh tracks was noted in the areas that had been poisoned for 68 days. Granite outcrops were searched in these areas, and only nine live euros were seen. There was also little evidence of live euros near mills that had been poisoned for 14-21 days.

During the previous survey, in November, 1956, particular attention had been paid to the Shallow Well area (4 on map) because it carried a dense euro population and near-by soaks prevented useful results being achieved by poisoning for the customary six days. At the time of this campaign, some of the soaks had dried out, but within one mile of Shallow Well soaks containing up to two inches of free water were being used by euros. Nevertheless there were dead euros all around the soak area, and these animals had presumably used the mills at some time or other during the protracted period of poisoning. C.S.I.R.O. observations have indicated that animals chased from soaks by fighting could be expected to drink at the nearest artificial water.

Of the nine live euros seen in the Shallow Well area, seven were at these soaks. The surrounding rocky country was traversed, and of the 29 pads examined only two showed fresh euro tracks. The survey had been timed so that a standard transect (ie. 20 minutes before sunset at 15 m.p.h.) could be made between Shallow Well and Knobs Well—this being the area containing the soaks. Standard transects during

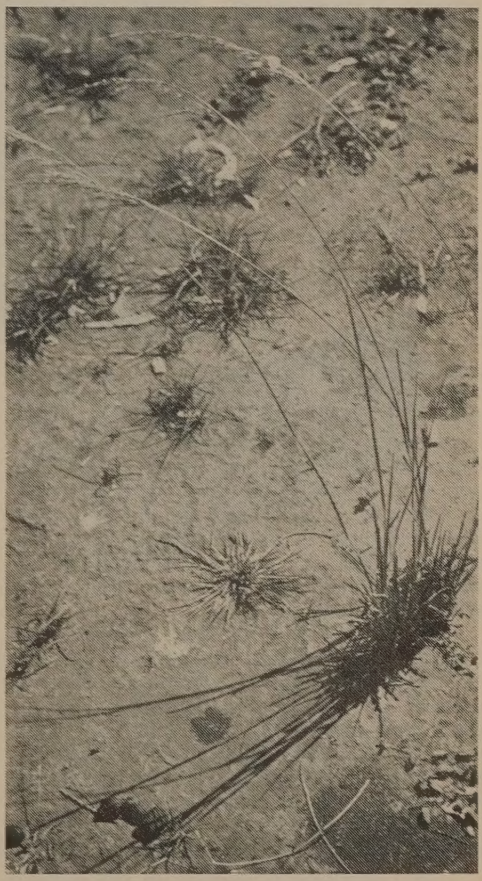


Fig. 7—Weeping Grass *(Chrysopogon)* which has been heavily grazed by euros. Nevertheless much of the seed has been allowed to form

the 1956 survey gave counts of 33 and 40 euros in 2.2 miles. On this survey no euros were seen—except many dead ones under trees.

It will be seen from Table 2 that at the time of the check-survey at least 11,500 euros had been killed on the area served by the poisoned water points, which was

(2) Although the stocking rate was greatly increased in a few paddocks, stock remained in good order for the months they were concentrated.
(3) Through careful handling it was possible to move stock in September without harming them.

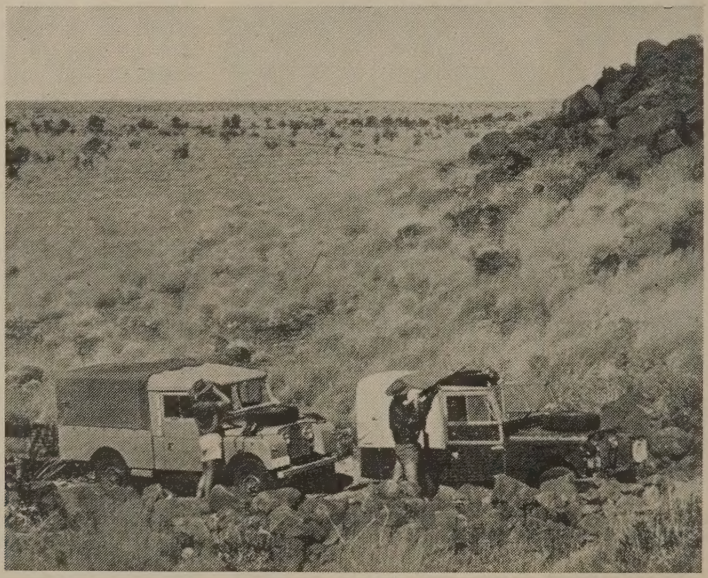


Fig. 8—Shooting euros for sampling, in typical spinifex country

approximately 120,000 acres. An additional 1,250 euros were poisoned before heavy rain fell; and the treated area is now almost completely cleared of euros. It should be emphasised that the campaign that gave this very satisfactory result did not involve as much time, manpower or money as had been required to poison 15,000 euros over the entire 15-year period during which the traditional six-day poisoning operations were employed.

C.S.I.R.O. studies on euro reproduction indicate that no significant increase due to breeding will occur while poor seasons persist. Even in a run of good seasons a local euro population that had been dealt with effectively by a well-planned poisoning operation should not build up to pest proportions for at least ten years.

The following points in the Talga Talga campaign are worth emphasising:—

(1) All stock remained on the station during the whole period of the operations.
(4) The losses among stragglers were negligible.
(5) Stock withstood the above treatment despite drought conditions and losses due to drought were no worse than on adjoining stations.
(6) Excellent results were obtained despite nearby natural water.
(7) Although the main kill occurred during the early part of the campaign, occasional euros were still being poisoned after 68 days. This emphasises the desirability of an extended poisoning period.

ACKNOWLEDGMENTS

The authors are grateful to Mr. J. Greene, the former owner of Talga Talga, for much practical information on water poisoning techniques. Some of the equipment used had been designed and tested by him during previous euro poisoning campaigns. His friendly co-operation and assistance with poison trials he allowed to be carried

out on Talga Talga were much appreciated by C.S.I.R.O. officers while they were working in the district.

LATER OBSERVATIONS

Since this article was written, the poisoned area was visited by H. Suijdendorp, the Department of Agriculture's Regional Adviser, Carnarvon. In a letter to E. H. M. Ealey, dated August 1, he wrote:—

> Euros on the 100,000 acres poisoned by Richardson were conspicuous by their absence. There were no tracks over wheel-tracks made a week prior to our visit. The vegetation in the poisoned area showed definite improvement when compared with the euro-infested region. A good stand of annuals was present among the spinifex tussocks, and a light scattering of Kapok bush seedlings was noticed all over the stony hills.
>
> Considering this is the first wet season after the removal of the euros, this response should be considered well worthwhile.
>
> Many of the local pastoralists have visited the region and for this coming summer a big poisoning campaign is planned to cover a region of well over half a million acres.

TAPEWORMS IN DOGS

Nearly all farm dogs are infested with tapeworms to a greater or lesser degree. Where heavy infestations occur, the dog's health may suffer unless the animals are specificially treated for the removal of the parasites.

There are many species of tapeworms and infestation commences with small heads which attach themselves to the bowel wall and grow by adding segments until, in some species, the adult tapeworm may be composed of a head and hundreds of segments with a total length of up to 6 ft.

Segments from the tail end of the worm, fall off at intervals and are passed in the droppings. They commonly cause irritation and when a dog is seen dragging itself along the ground in a sitting position it is usually a sign of tapeworm infestation.

While tapeworms rarely cause death, heavy tapeworm infestation can lead to digestive upsets, paralysis of the hindquarters and can be a contributing cause of skin diseases.

Arecoline hydrobromide is the best drug available for expelling tapeworms. It is sold in tablet form and an easy method of administration is to crush a tablet and dissolve in a small quantity of water in a small medicine bottle. Slip a finger inside the dog's cheek to form a pouch, pour in the drench and hold the mouth shut until the liquid is swallowed. Doses, according to dog size, are:

	Grain.
Terrier	¼
Sheep Dog	½
Kangaroo Dog	1

As the drug sometimes causes vomiting, walk the dog for a few minutes after dosing, then put it on the chain and observe for half an hour. The drug should produce violent purging, but if this does not occur, give a second dose using half the quantity of arecoline hydrobromide given in the initial dose.

All droppings should be removed and burnt when the purging ceases.

Repeat the dose as a routine practice every six months.

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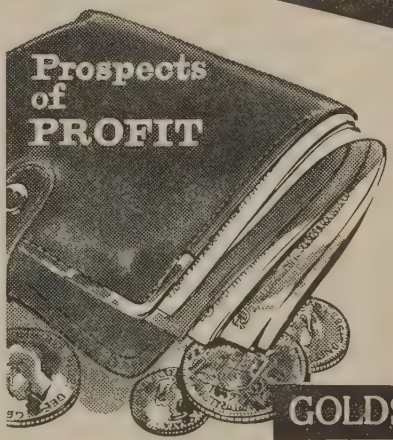

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INSECT PESTS

DRIED FRUIT AND MEAL INSECTS

By C. F. H. JENKINS, M.A., Government Entomologist

DRIED and preserved foodstuffs such as raisins, currants, oatmeal, nuts, and flour are often found to be "weevily" after long storage. Strictly speaking, the term "weevily" should be applied only to material attacked by certain types of beetles, but the expression is now popularly used in connection with practically any insect infestation of stored products.

RICE WEEVILS
(*Calandra oryzae* L.)

The rice weevil is the common grain weevil of this State, and may sometimes be found attacking stored foods such as macaroni, spaghetti, etc., as well as grain.

Being a true weevil the head is produced into a long snout at the end of which the mouth parts are borne. The female weevil chews a small hole into the grain or other solid food material and deposits therein an egg; the hole is then plugged with a gelatinous-like material which seals the entrance. The young grubs hatch and feed in this position until full-grown, when they pupate and finally the adult weevil forces its way to freedom.

Fig. 1.—Rice Weevil (enlarged)

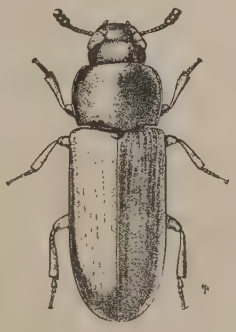

Fig. 2.—Flour Beetle (enlarged)

FLOUR BEETLES OR "MILL FLOSS"
(*Tribolium* spp.)

The flour beetles like the weevils are tiny brown insects which infest various foods, but chiefly flour, oatmeal, bran, etc. There are several species, all rather flattened in shape and lacking the typical weevil snout. The eggs are laid loosely amongst the flour or bran and under favourable conditions vast numbers may soon develop.

THE INDIAN MEAL MOTH
(*Plodia interpunctella* Hbn.)

The Indian meal moth is one of the commonest moth pests found in home groceries, and is the parent of the pinkish-white "grubs" or caterpillars so often found in raisins, dates, figs, etc. There are several other moths such as the flour moth (*Ephestia kuhniella* Zell.) and the dried fruit moth (*E. cautella* Walk.) which may also be implicated, but all are superficially very similar and have comparable habits.

The eggs are laid on or near the foodstuffs by the parent moth, which has a wing span of about $\frac{5}{8}$ of an inch. When at rest the meal moth shows a broad creamy band across the general coppery brown colour of the wings.

Fig. 3.—Indian Meal Moth, showing moths and caterpillars and the silken webbing formed on grain

CONTROL

Prevention.

Housewives can do much to avoid losses by purchasing only small quantities of dried fruits, oatmeal, flour, etc., so that they may be consumed fairly quickly. Care should be taken to examine food before storing away to ensure that it is quite clean at the time of delivery.

In many cases insect infestations can be traced to an old packet of fruit, oatmeal,

or flour, which has been pushed to the back of a cupboard and forgotten. All such centres of breeding should be destroyed. Wherever possible goods should be stored in insect-proof tins or jars.

Astonishment is often expressed at the development of "weevils" in apparently sealed containers. The explanation is that insect eggs have already been laid on the food before it was packed away or in some cases that eggs have been laid around the lid and the tiny grubs have been able to squeeze through where no mature insect could gain access.

Treatment.

Where small quantities of material only are to be dealt with and where the damage done does not warrant the destruction of the food, good control may be obtained by putting the infested foodstuffs in the oven for about an hour and allowing the material to be warmed through to a temperature of from 130° to 140° F. Care must be taken to see that the oven is not too hot. A gradual heating at a low temperature will raise the entire mass to the desired figure whereas a short intense heating may entirely spoil the commodity being treated. During hot summer weather if the material is spread thinly and placed in the sun on an iron tray good control may be achieved.

Where larger quantities of material require treatment these should be placed in a gas-proof box or bin and fumigated with carbon bisulphide. The dosage should be worked out at the rate of 4 lb. of fumigant to every thousand cubic feet of space but the quantity used may be greatly increased if leakages occur. A bin measuring 3 ft. x 2 ft. x 3 ft. would require about four tablespoonfuls.

The fumigant should be placed in a shallow saucer on the top of the infested material and the lid and all cracks should be thoroughly sealed. The box should be left closed for 48 hours.

Infested pantries, cupboards or shelves should be thoroughly cleaned and sprayed with one of the proprietary fly sprays containing pyrethrum. Smoke bombs containing DDT or BHC may also be used and DDT, BHC or Lindane dusts or sprays may be used to treat cracks and crevices.

WARNING

Carbon bisulphide is explosive and inflammable, but will not injure the foodstuffs for future consumption, although the gas is toxic to humans.

DDT and BHC should not be allowed to contaminate foodstuffs.

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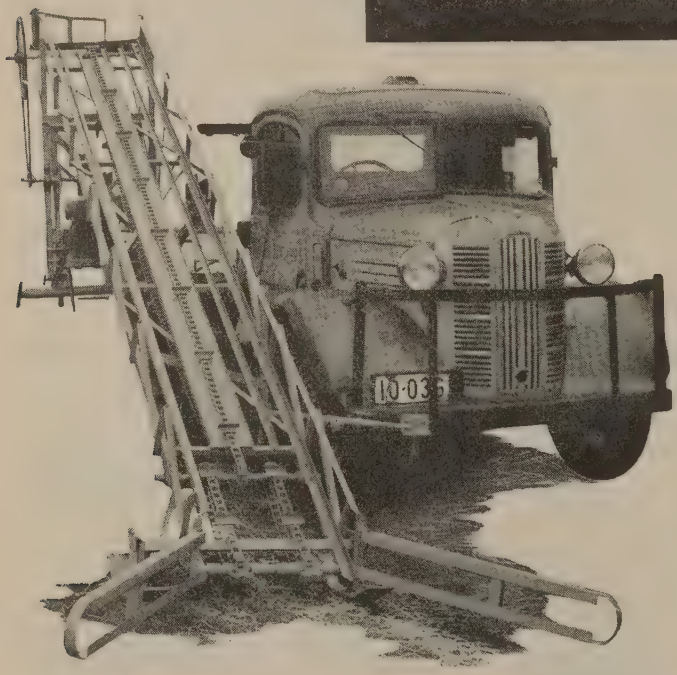

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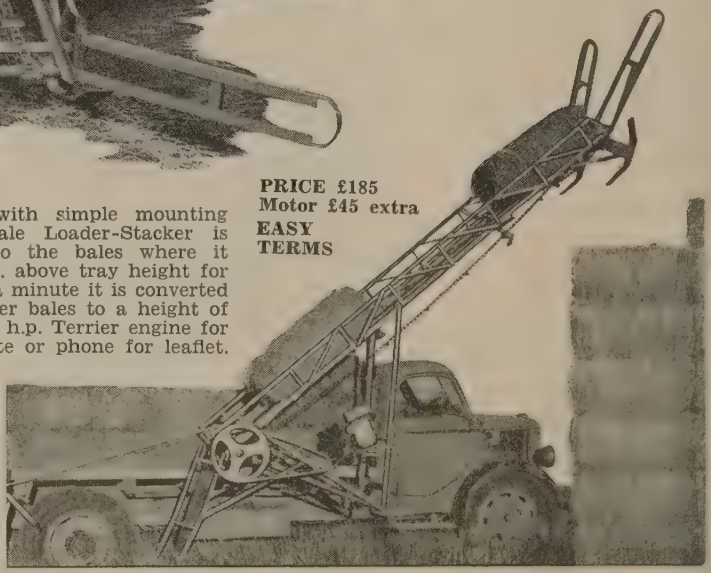

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PLANT DISEASES

DOWNY MILDEW OF ONIONS

By R. F. DOEPEL, B.Sc. (Agric.), Plant Pathologist

DOWNY mildew of onions, caused by the fungus *Peronospora destructor*, is widespread in Western Australia. In market gardens adjacent to Perth where the majority of onions are grown the disease occurs each year in spring and early summer crops and often attains epidemic proportions.

Leaves affected with mildew turn yellowish green and wither back from the tips (Fig. 1). The disease is most noticeable on the older leaves but the younger leaves are also attacked as they develop. The fungus can often be seen as a grey-violet downy covering on the leaves in the early morning after rain or dew. If leaf damage is severe, bulb development is retarded and yields are lowered.

Seedstalks are also attacked by mildew (Fig. 2) and commonly bend over or break at the site of infection (Fig. 3). As a result seed quality and yields are greatly reduced.

DISEASE DEVELOPMENT

The fungus grows in the leaf tissues and produces minute spores or fungal seeds which are blown about by wind or splashed by water. These spores give rise to new leaf infections and so spread the disease rapidly through the crop and to neighbouring crops.

The fungus may progress inside the leaves down into the bulb; such bulbs if retained for seed purposes can carry the disease.

Resting spores, known as oospores, are also produced in the leaf tissues and can survive in diseased leaves in the soil to infect healthy plants the following season.

Fig. 1—Onion plants showing leaves attacked by mildew. Affected leaves turn greenish yellow, hang down limply and wither back from the tips

Mildew development is favoured by cool moist weather conditions; frequent dews encouraging prolific spore production by the fungus.

Fig. 2—Onion seedstalk affected with mildew—early stage. The portion of the stalk showing white has been girdled by the fungus

HOST RANGE

In this State, downy mildew has only been recorded on onions and shallots although elsewhere it has been found also on leek and garlic.

CONTROL MEASURES

The following measures are recommended for adoption by growers:—

1.—Spraying.

Both field and seed crops should be sprayed during the susceptible period with Zineb fungicide at a strength of 1½ lb. in 100 gallons of water. To obtain good coverage and disease control it is essential that an efficient wetting and spreading agent, such as Triton B 1956 or Agral LN, should be added to the spray at the rate of 4 to 6 fluid ounces in 100 gallons spray.

The first sprays should be applied before mildew develops and then at 10 to 14 day intervals during the season.

Zineb is marketed under such trade names as Dithane Z-78, Zebtox, Zineb 65, etc., and can be obtained from seedsmen and stock firms.

2.—Sanitation.

As crop remains may serve to carry over the mildew fungus from season to season, all dead leaves and discarded bulbs should be burnt after harvesting has been completed.

3.—Rotation.

Onions should not be grown more frequently than once every three years on the same land. This will help prevent infection of seedlings, field and seed crops from diseased refuse in the soil.

Fig. 3—Onion seedstalk affected with mildew—late stage. The stalk has withered and bent at the site of attack

FARMERS

This is YOUR Journal, and it has been written, edited and presented in a sincere endeavour to give you helpful information in an interesting manner.

We would like to have your views on the Journal—to know whether you like it or whether you don't. Drop a line to the editor and tell him the features you like and don't like in this issue—or the features you hope to see in future issues.

This Year's EXPORT LAMB CARCASS COMPETITION

By N. DAVENPORT, Senior Adviser, Meat Production

THE Export Lamb Competition will be conducted through the Royal Agricultural Society again this year. Last year, due partly to the season, entries were well below those of previous years and if this competition is to continue, greater support from breeders is necessary. I am sure you will agree that such a competition has undoubted value both for producers in recognising the type of lamb required, and also as an advertising medium for the sale of high quality Western Australian lamb on the English markets.

For many years now we have been producing above our local consumption and the surplus has been exported, mainly to the U.K.

New Zealand is a serious rival and it is essential for successful competition, to produce the right type of lamb and advertise it well on this market.

We know now that the serious price drop last season in export, and hence local prices, was due in the main to the abnormal selling of English home-killed lamb during their record drought at that time. Prices recovered very well but, unfortunately, most of our growers had already sold. They are now well above ruling rates of a year ago.

Western Australian lambs are of high quality. Dr. Hammond, during his recent trip here, said that they are the best sent from Australia. This opinion is borne out by the outstanding success of this State in the six years of the All-Australian Competition judged in London, when we gained the Champion Award in four of the six years. So we obviously have something good to advertise.

The export market establishes a floor price during the seasonal glut period and is thus extremely valuable as a safety-valve to obviate uneconomic returns to the grower through local oversupply at that time. This fact becomes increasingly important as production progressively increases as it must do, particularly in view of the considerable development that is going on in the higher rainfall areas of new country so well suited to the production of meat.

With regard to the competition itself two classes are provided and some breeders may not be fully conversant with them. For both classes only first quality carcasses within the 26-42 lb. weight range are accepted, with penalties for those weighing over 36 lb. In both classes also the mother can be of any breed of ewe except a straight British breed ewe or crossbred of

two British breeds. Border Leicester, Romney Marsh or English Leicester cross ewes are almost entirely used.

The classes are different in relation to the sire. Class 1 is for lambs sired by Southdown rams. Class 2 lambs can be sired by rams of any other British breed. Class 1 is restricted to Southdown rams because lambs by this breed are superior at light weights and the small lamb is still most in demand in England.

Up to three entries are allowed each competitor in each class. There must be three lambs in each entry but five can be, and usually are, sent to the Works and either the grower or his nominee (which means the Works grader as a rule), selects the best three.

Entries are free. The killing period is during July to December, and entries can be made to the Royal Agricultural Society at any time, but at least seven days before the lambs are sent away.

It is usual to include the competition lambs in a truckload, but when this is not suitable some growers have taken them to the Works by road and made it a business trip. Where it is not usual practice to market direct to the Works, the West Australian Meat Export Works, Robbs Jetty; Anchorage Butchers, Coogee; or Borthwicks at Albany, will be glad to receive entries in any case.

The lambs must be clearly marked, particularly when two or more entries are sent at once, so that each entry can be separately and easily identified.

The lambs are judged here and also in London. Before being shipped all lambs will be displayed at the W.A. Meat Export Works on a day late in January so that growers can make comparison between their own and other entries.

The prize money is generous and is donated by the Australian Meat Board. The W.A. Meat Export Works purchase all carcasses. The grower has no further expense after delivery to any of the Works and receives the full gross returns in London plus skin values. This, you must agree, is exceptionally favourable treatment.

Printed copies of the conditions of the competition with entry forms, may be obtained from the Royal Agricultural Society; the Australian Meat Board, St. George's Terrace, Perth; the several stock firms and the regional and central offices of the Department of Agriculture.

With such a good start to the season lambs should do well and there will be many growers, whether they have entered for previous competitions or not, who will undoubtedly have lambs well suited for the competition.

Why not enter?

SUB-STANDARD MILK

The Minister for Agriculture (Mr. C. D. Nalder)—commenting on an announcement in the Press regarding action where milk supplied for consumption was below the health standards—said that an impression might have been created among both producers and consumers of whole milk that no action would be taken for 12 months should low quality milk be supplied to consumers.

Mr. Nalder said that—while in comparatively few instances the milk from a specific herd might fall below standard during a portion of the year—the great bulk of the milk being delivered by farmers was of good quality, and it was believed that milk being supplied to consumers complied with health standards.

Farmers who are having difficulty in maintaining the requisite standards would continue to receive advice from the Whole Milk Board and the Department of Agriculture as to means whereby their problems may be overcome, rather than by taking any legal action against the farmer. It is believed that the adoption of recognised principles in animal husbandry and breeding can provide a practical remedy.

Mr. Nalder said that—where advice was not taken and milk of low quality continued to be supplied—it would still be necessary to take measures to ensure that consumers received milk in compliance with the standards determined under the Health Act.

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Honey Flora Calendar for October

COMPILED BY R. S. COLEMAN, APICULTURAL SECTION, WITH ASSISTANCE FROM THE BOTANICAL BRANCH

Common Name	Botanical Name	Where Found	Honey		Quality of Pollen	Remarks
			Quality	Quantity		
Brown Mallet	*Eucalyptus astringens*, Maiden	Great Southern	Good	Good	Good	This is a good yielder; however, it is usually only found in plantations as most of the early forests have been cut out for their bark.
Poot	*Eucalyptus decipiens*, Endl.	Grows in the mallee areas in the Great Southern and on the lee side of limestone hills in the Wanneroo area	Good ..	Good .	Good ..	The tree looks very much like a tuart in the coastal areas but is usually a mallee in the outer wheatbelt. Beekeepers along the coast regard it as a fairly reliable producer, but as it only occurs in small stands is not very important in these areas.
Gooseberry Mallee	*Eucalyptus calycogona*, Turcz.	Eastern Goldfields, Ravensthorpe, Esperance	Good	Good	Good	This mallee has not been worked in Western Australia to any large extent, but is highly regarded in Victoria.
Karri	*Eucalyptus diversicolor*, F. Muell.	The winter flowering karri occurs at Denmark and Albany	Excellent	Good	Poor .	There are only small patches of coastal karri. It produces in the winter. Can be regarded as a major flow as bees will store honey from trees growing near the coast.
Snap and Rattle Yorrel, Small Budded Mallee	*Eucalyptus gracilis*, F. Muell.	Widespread throughout the State	Good	Good	Good ..	Widely differing reports about this tree from various areas. Some areas report excellent flows and high quality honey, in others the tree is not regarded as a nectar-bearing tree at all.
York Gum	*Eucalyptus loxophleba*, Benth.	From the Murchison River on the road to Carnarvon to the Great Southern and east to Salmon Gums	Good . .	Excellent	Poor .. .	Major honey plant but deficient in pollen. When the capeweed is in flower, the bees will store quite a lot of surplus. Bud development is about 9–10 months. As it grows on good agricultural areas, most of it has been cleared.
Redwood	*Eucalyptus oleosa*, F. Muell.	Mallee areas and wheatbelt ...	Good .	Good	Good	Most varieties of this tree in the Eastern States are good nectar producers. Here in Western Australia, they do not seem to be worked by the beekeepers and not much is known under local conditions.
Bell Mallee	*Eucalyptus preissiana*, Schau.	Most mallee areas	....	....	....	Many reports of the blossoms being worked by bees.
White Gum or Wandoo	*Eucalyptus redunca*, Schau.	Spring white gum is found mainly on the tops of the hills, starting mid-September and going through to Xmas time in that area from Bolgart to Wandering	Excellent	Excellent	Poor	Honey in late spring and early summer; seems to be found only upon gravelly hills in the Dale-York areas.
Flooded Gum	*Eucalyptus rudis* Endl.	River and water courses, in some areas where the water table is high, grows away from apparent water courses	Excellent	Excellent ..	Excellent .	Major honey plant.

Sweat Bush or Honey Bush	*Adenanthos cuneata*, Labill	Esperance sand plain	Good	Good	Good	Regarded as an excellent honey plant in the Albany area.
Diamond Bush	*Bossiaea Laidlawiana*, Tovey et Morris	In the karri forests	Good	Good	Excellent	One of the best pollen plants we have here in Western Australia. Its main disadvantage is that it tends to make the hives swarm.
	Bossiaea ornata, (Lindl.) Benth.	Common throughout the South-West	Unknown	Unknown	Good	
Holly Leaf Banksia	*Banksia ilicifolia* R.Br.	Low-lying country near the coastal sand plain. Tends to be associated with a high water table	Good ..	Good	Good	Uncertain yielder and has a long flowering season.
Bull Banksia	*Banksia grandis*, Willd.	Widespread	Poor	Good	Good	The very valuable flow in the late spring when nothing else is available keeps the bees in good heart between the major seasonal flows.
	Dryandra armata, R.Br.	Gravelly soils in the wetter wheatbelt	Good ?	Good ?	Good	Has been reported as a good honey plant.
	Dryandra Kippistiana, Meissn.	Midland sand plain, gravelly soil	Good ?	Good	Good	Apparently produces well. Some adverse reports on the flavour of the honey.
	Dryandra, nobilis, Lindl.	Gravelly soils, high rainfall	Good ?	Good ?	Good ?	We need more information on this plant.
Pingly	*Dryandra patens*, Benth.	....	Good	Good	Good	Used by beekeepers to build up the bees.
	Dryandra polycephala, Benth.	Gravelly soils north of Perth	Fair ..	Fair	Good ..	More information will be appreciated on this plant.
Honeysuckle	*Lambertia multiflora*, Lindl.	Widespread	Good .	Good	Good	Has red and white flowered varieties but seldom found in large quantities.
Chittick	*Lambertia inermis*, R.Br.	Southern sandplain	Good	Good	Good	Flowers most of the year with its flush period in spring. Regarded as a good flower by local beekeepers.
Paper Bark	*Melaleuca pauperiflora*, F. Muell.	Common on the coast ..	Good	Good ..	Good	Not extensively worked by the beekeepers.
Paper Bark	*Melaleuca rhaphiophlla*, Schau.	River courses throughout the South-West	Good	Good	Good	One of the reliable small flows.
Peppermint	*Agonis flexuosa*, (Spreng.) Schau.	Coastal plain south of Perth ..	Very poor	Good	Non-existent	Produces some of the worst honey in Western Australia. Does not seem to be in the karri forests but only on the coast.
Orange	*Citrus sinensis*, Osbeck	Cultivated	Good	Good ..	Good	It is regarded as a first class honey in other States. There have been a few reports on orange honey being collected here in Western Australia.
Prickly Poison	*Gastrolobium spinosum*, Benth.	Widespread	Good	Good	Good	Has a sweet, clear, but slightly watery honey. Occurs on lateritic soil types in the Katanning district.

It will be seen from this list that information concerning many nectar-bearing plants is far from adequate. We would appreciate further information from beekeepers.

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THERE'S ONLY ONE 'JEEP' . . . WILLYS

The calf on the left is by a Friesian bull from an A.I.S. cow. It is fostered by a reject Friesian cow, whose own calf by a Poll Hereford bull is shown on the right. The calves are linked together by a short chain and swivel attached to their collars.

FOSTER-MOTHERING OF CALVES

By M. CULLITY, Superintendent of Dairying and K. W. SIMES, Manager, Research Station, Wokalup

"SAVE those calves" is a slogan which has been used frequently in propaganda to reduce the slaughter of heifers when it is thought that the supply of replacement animals to our dairy herds might be unduly low. Although there is no fear of this at present, the wastage of calves both heifers and bulls, in Western Australia is unduly large.

If it is assumed that 90 per cent. only of the 130,000 dairy cows in Western Australia at March 31, 1959, calved in the previous year, there should have been 117,000 calves. The statistical data as at that date however, showed the following:—

Heifer calves	33,003
Bull calves	10,352
Deaths during year	11,133
Slaughterings during year	31,841
Total	86,329

It appears therefore, that over 30,000 calves born during the year were not accounted for in the statistics and the only assumption that can be made is that these animals were destroyed at birth or otherwise that their deaths were not recorded. All heifer calves that are born are not needed for replacement purposes and few of the bull calves are needed as sires. However, both are a potential source of meat and therefore of income to the dairy farmer providing that he can rear them with his existing feed supplies and labour resources.

In the Artificial Breeding Service, which has been operating in the dairying districts since 1956, beef bulls of the Aberdeen Angus and Poll Hereford breeds are used and approximately 8 per cent. of all first inseminations are from these breeds. These bulls clearly colour-mark their progeny so that the heifers could not possibly be mistaken for dairy cattle. Dairy farmers are encouraged to mate their inferior cows to these bulls on the assumption that the calves would not be slaughtered at birth but would either be carried on for varying lengths of time on the farmer's own property or sold to others who had the necessary carrying capacity.

On small dairy farms, rearing of surplus calves could only be by the use of skim milk which otherwise could be used for the rearing and fattening of pigs with possibly little difference in the final profit. On larger properties however, where some beef raising is carried out in conjunction with dairying there is an opportunity for rearing the male progeny of the dairy herd with the minimum of labour by foster-mothering these calves on the matrons of the beef herd.

Foster-mothering as a means of rearing calves is a common practice in England and elsewhere where in specialised practices up to ten calves are reared per cow per lactation. In these cases, the calves are not allowed to run with the foster-mothers continuously but are put with them three or four times daily.

Demonstrations of the practicability of this on a minor scale and with the calves continuously with the cows have been given at the Wokalup Research Station during the past few seasons. The technique which has been followed is to transfer a young dairy calf to a beef cow of quiet disposition which has calved about the same time. A little patience and perseverance quickly overcomes any reluctance to accept the second calf. The two calves are coupled together with a small swivel chain about 18 in. long attached at each end to a leather collar. The swivel prevents buckling or knotting of the chain if the calves move around. It is not long enough for the calves to become entangled around posts or even around the cow's legs. For a few days after the second calf is introduced the cow and the calves are kept in a small paddock under observation in order to be certain that the introduced calf is being allowed to suckle. After a few days when it is clear that it has been accepted they are moved to a larger area and allowed to roam with the main herd. They are closely watched for a short time longer to avoid any sudden rejections, although this has not been experienced at Wokalup.

The following data from calves reared during 1957 and 1958 shows that this method was highly successful.

In 1957 nine fostered calves were compared with eight that were bucket fed. Ages were as close togther as could be arranged. The following table gives the comparison in the relative growth rates:—

How Reared	Birth Weight	Weaning Weight	Sale Weight	Gain to Weaning	Gain to Sale
	lb.	lb.	lb.	lb.	lb.
Fostered	78	479	627	401	549
Bucket Fed	84	383	568	299	484

In 1958 comparisons were made between 18 mothered compared with 18 fostered calves. Unfortunately owing to the more rapid gain of some of the mothered calves a number were weaned several weeks before their fostered mates, so final comparative figures are not available for the whole group. The detail of the movement in weight of each pair is in the following table:—

MOTHERED AND FOSTERED CALVES—PAIRS

	Pair	Birth		Weaning		Gain	
		Date	Lb. Wgt.	Date	Lb. Wgt.		
1.	M.	11/3/58	65	7/1/59	536	471	
	F.J.	22/3/58	61	7/1/59	572	511	— 40
2.	M.	8/4/58	50	7/1/59	592	542	+ 58
	F.F.	6/4/58	78	7/1/59	562	484	
3.	M.	15/4/58	72	18/11/58	542	470	+ 36
	F.F.	15/4/58	95	7/1/59	529	434	
4.	M.	16/4/58	61	18/11/58	482	421	
	F.S.	16/4/58	76	7/1/59	516	440	— 19
5.	M.	19/4/58	93	7/1/59	596	503	
	F.F.	22/4/58	89	7/1/59	606	517	— 14
6.	M.	26/4/58	83	18/11/58	580	497	
	F.F.	24/4/58	101	7/1/59	664	563	— 66
7.	M.	28/4/58	76	7/1/59	546	470	
	F.F.	25/4/58	94	7/1/59	590	496	— 26
8.	M.	19/5/58	66	18/11/58	424	358	+ 32
	F.J.	16/5/58	64	7/1/59	390	326	
9.	M.	22/5/58	68	18/11/58	422	354	
	F.J.	23/5/58	56	7/1/59	506	450	— 96
10.	M.	2/6/58	78	7/1/59	452	374	+ 59
	F.J.	3/6/58	71	7/1/59	386	315	
11.	M.	16/6/58	90	18/11/58	420	330	+ 75
	F.J.	22/6/58	61	7/1/59	316	255	
12.	M.	19/6/58	78	7/1/59	488	410	+144
	F.J.	28/6/58	58	7/1/59	324	266	
13.	M.	1/7/58	78	18/11/58	430	352	+ 98
	F.J.	6/7/58	62	7/1/59	316	254	
14.	M.	4/7/58	80	7/1/59	522	442	+168
	F.J.	3/7/58	79	7/1/59	353	274	
15.	M.	14/7/58	90	7/1/59	540	450	+181
	F.F.	14/7/58	81	7/1/59	350	269	
16.	M.	15/7/58	88	7/1/59	462	374	+151
	F.J.	11/7/58	51	7/1/59	274	223	
17.	M.	25/7/58	87	7/1/59	436	349	
	F.F.	29/7/58	100	7/1/59	460	360	— 11
18.	M.	24/8/58	76	7/1/59	320	244	+ 7
	F.F.	19/8/58	93	7/1/59	320	237	

M. = Mothered. F.J. = Fostered Jersey.
F.F. = Fostered Friesian. F.S. = Fostered A.I.S.

The average gains in weight of the pairs which were weaned at the same time were:—

Mothered calves—427 lb.
Fostered calves—358 lb.

The average birth and weaning weights were:—

Mothered—71 lb., 499 lb.
Fostered—78 lb., 436 lb.

The growth of the fostered calves was considered highly satisfactorily. From a perusal of the table it will be noted that with the exception of one sired by a Shorthorn bull the remainder were sired by Friesians and Jerseys. Generally the greatest margins between the mothered and the fostered calves were in the case of the Jerseys which in seven cases out of nine made smaller gains than their beef crossbreed foster mates.

On the other hand, most of the Friesian calves grew somewhat more rapidly than their foster mates.

Three cows carried two foster calves in addition to their own. The details of these are as follows:—

MOTHERED AND FOSTERED CALVES—THREES

Triples	Birth		Weaning		Gain
	Date	Lb. Wgt.	Date	Lb. Wgt.	
1. M.	11/5/58	58	18/11/58	420	362
F.J.	8/5/58	76	7/1/59	416	340
F.F.	9/5/58	85	7/1/59	482	397
2. M.	2/6/58	79	18/11/58	406	327
F.F.	25/5/58	101	7/1/59	460	359
F.J.	2/6/58	66	7/1/59	394	328
3. M.	1/8/58	79	7/1/59	334	255
F.H.	8/6/58	64	7/1/59	400	336
F.S.	26/6/58	68	7/1/59	330	262

The average weight gains were somewhat comparable in each case and at least one of the foster calves proved superior to the mothered calf in each group.

ACKNOWLEDGMENT

The authors wish to acknowledge the assistance received from Mr. W. E. Blechynden who paired the calves and watched their progress in suckling while joined.

MURESK AGRICULTURAL COLLEGE

(Department of Agriculture)

Parents are reminded that applications for 1962 admission to Muresk Agricultural College close on December 31 of this year. A preliminary selection of 1962 entrants is made after the Junior results are available early in 1961.

The successful applicants then continue with Sub-Leaving, or higher studies, in 1961.

Before the course can be commenced students must have attained:—

(a) Sub-Leaving Standard in English, Maths. A, Chemistry and Physics (including Magnetism and Electricity if possible).

(b) Junior Standard Bookkeeping.

Should places still exist for 1962 commencement after the preliminary selection early in 1961, they are filled in order of application during 1961, by qualified applicants.

Duration of Course.—Two years.

Fees.—Approximately £180 per annum covering full residential charges.

Scholarships.—Department of Agriculture (3), the "Countryman," and J. J. Poynton Memorial (2).

Boarding Allowance.—Most Muresk students are eligible for the Education Department Boarding Allowance (£50 per annum).

Full details of the College are obtainable from the Principal, Muresk Agricultural College, Muresk, W.A., or the Department of Agriculture, Perth.

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The Fruit Industry IN OTHER LANDS

By F. MELVILLE, B.Sc. (Agric.),
Horticultural Adviser

4—THE UNITED STATES OF AMERICA (continued)

PEARS

COMMERCIAL pear growing was seen only in Washington State where production is in the vicinity of five million bushels or about 12 per cent. of the total fruit production of the State. Two-thirds of the pears are Bartletts which are used extensively for canning. The other main variety is D'Anjou with lesser quantities of Bosc and Winter Nelis all of which are used for the fresh fruit trade. In the last six years a serious depletion in tree numbers has occurred due to the inroads of Pear Decline a new disease the cause of which at present is unknown.

This caused a drastic drop in production in the early fifties but with many new plantings taking place and the rather restricted outlets for Bartletts it is felt that pears could easily be over produced again. The Max Red strain of Bartlett is not being planted in large quantities. Some growers are making double plantings of Bartlett and Max Red with the object of removing whichever proves the less

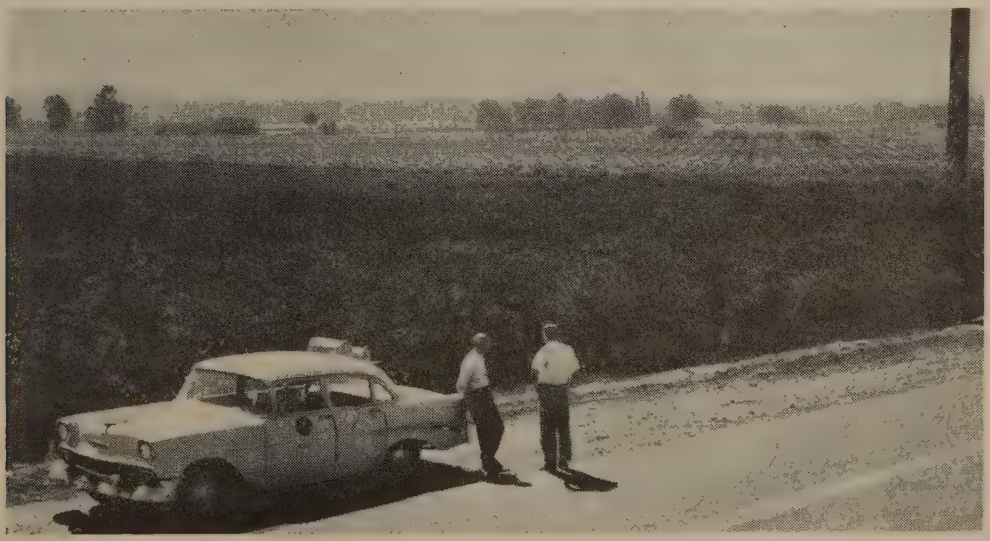

Fig. 29—Visiting citrus orchards in Ventura County with the Farm Adviser

Fig. 30—Three-year-old Eureka lemons on Sweet Orange stock in a Ventura County orchard

attractive economically later on. The Max Red to date has not proved superior to Bartlett as a dessert variety although some canners seem to prefer it.

A Stewart strain of Bartlett is now under observation. The tree produces wide angle crotches and is therefore easier to train but in other respects it has normal Bartlett characteristics.

PEAR DECLINE

Pear Decline was earlier reported in Western Canada from whence it has spread through Washington and is now in Oregon and Northern California. In Washington the serious depletion in tree numbers and production has promoted a detailed investigation of the problem by research personnel.

The condition appears first as a permanent wilting of the foliage in the summer followed by stoppage of growth, poor leaf colour and size and general decline in tree health. The foliage colours early in the autumn and subsequent cropping is uneconomic. Sometimes the onset is rapid at other times the trouble develops slowly. It has been estimated that up to half the pear trees in Washington are affected.

The problem has been investigated from numerous angles. The most promising lead has come from a study of rootstock and scion relationships. It has been noted that trees showing decline are usually trees on Serotina rootstocks. A study of the bud union of these trees shows that a blockage of the phloem sieve tubes occurs at this point in diseased trees. Tissue staining at the union is also usually found in affected trees. It is thought that much of the trouble has arisen from the large-scale use of the Serotina or Japanese stock in past years. Why the disease should suddenly appear on old trees is not known but in some respects there is a similarity with Tristeza in citrus on sour orange stocks. There is as yet no proof of a virus factor nor a possible insect vector.

That the blockage of the conducting tissue is a major factor is demonstrated on old previously healthy Anjou pear trees which as a result of winter injury to the trunks were inarched some years ago with young trees on Serotina stocks. Inarched trees have now declined and the damage is often confined to the inarched side of the tree. Conversely, a decline tree inarched with young trees on common pear roots is now showing signs of response to the unimpeded sap flow.

It is thought that the decline has now affected most of the trees on Serotina stocks and the position is unlikely to deteriorate further. Inarching as a con-

Fig. 31—The University of California Citrus Experiment Station, Riverside

trol measure on a commercial scale is not considered feasible.

PEAR LEAF SCORCH

A leaf scorch conditions in Bartletts similar to that seen in Western Australian orchards was noted in Wenatchee. Known as "Transpiration Burn" it is considered to be aggravated by mite injury. Although at the time the scorching occurs, mites may be very scarce or absent it is thought that the injury from continual puncturing and rasping of the leaf epidermis earlier in the season may lead to excessive evaporation so that during periods of stress the loss of moisture from the leaves exceeds the rate of incoming sap and the tissue collapses. Apart from controlling mites it was considered that reducing the foliage just prior to the stress period by summer pruning could be of benefit.

DISEASES AND PESTS

Scab.—Scab is not a problem in Washington. On the Eastern seaboard preliminary tests have indicated a new material Cyprex, which may be superior to Captan for scab control. Some phytotoxicity, however, may be involved at concentrations as low as 1 lb. per 100 gallons. Organic mercuries are not used on pears.

Fire Blight.—This is the most serious disease of pears and one for which there is no satisfactory control in some years. Antibiotics are effective in some instances but not satisfactory in all seasons. Recent years have proved serious for fire blight.

Pear breeding work at Beltsville is aimed at developing a blight resistant variety. One seedling is showing promise in this regard. The Bartlett is one of the most susceptible blight varieties.

Pear Psylla.—Psylla has spread widely in recent years and is proving one of the most difficult pests to deal with. It lives and feeds on the leaves and the exudate produced by the insect results in dirty unattractive fruit. A complete seasonal spraying is usually necessary to keep the pest in check.

POLLINATION AND FRUIT SET

Some benefits accrue from the use of Winter Nelis as a pollinator for Bartletts.

Fig. 32—Valencia orange trees on Troyer Citrange stock (right) have at nine years made bigger trees with higher yields than ten-year-old trees on Sweet Orange stock (left)

The fruit has a thicker neck and soluble solids are higher although it ripens quicker.

Work with hormone sprays at Davis has shown that in some years blossom sprays of 2,4,5-T.P. have increased setting on Bartletts but have sometimes been damaging to Anjou and Winter Nelis. There is also some evidence that autumn sprays of 2,4,5-T.P. can influence fruit set.

Amid thin has been tried as a thinning spray on Bartletts in Washington and on Winter Nelis in California.

BORON SPRAYS

Boron deficiency in pears has been corrected by autumn sprays. The symptoms are delayed foliation and poor growth.

BULK HANDLING

Bartlett pears are used largely for canning and interest is being shown in the use of bulk bins for the harvesting, transport and storage of pears required for this purpose. Bins similar to those for apples are used viz., 47 in. x 47 in. x 29 in. deep (outside measurements) and these are picked up at the orchard by straddle truck. The pears are stored in the bins and transported to the factory as required. Pears have been hauled up to 180 miles in bulk bins and also stored for 90 days prior to canning with satisfactory results. Bins are cheaper than the equivalent volume in lugs and there can be a 30 per cent. saving in storage space. Bruising has been no more prevalent in bins than in lugs.

PACKING

Pears for the fresh fruit market, mainly Bartletts and Anjous, are still packed in wooden boxes either lidded boxes or unlidded lugs. Numerous containers are permitted but the standard pear box or a shallower version as a lug are the common ones used. Pears for distant destinations are now mostly packed in polythene liners. The trade recognises the value of this method of packaging and will pay a premium. Special one-piece cardboard liners are used with the tops cut to conform to the contour of the bulge. These come to the packer folded with the polythene liner glued inside to facilitate the positioning of the liner prior to packing. The liners are not sealed but merely folded over before lidding.

Trials with tray pack cartons are in progress and it is felt that a change to cartons could come within the next year or two. It is thought that apple moulded

trays will be suitable for pears thereby curtailing the number of tray types to be stocked by packers. Wrapping may be necessary to prevent chafing.

All pears are washed in Washington as for apples and it is usual to use a fungicide such as sodium orthophenyl phenate.

STORAGE

At least 80 per cent. of the Washington pears destined for the fresh fruit trade are packed in polythene-lined boxes. The Film thickness is 0.0015 inch but permiability to both oxygen and CO_2 varies considerably with density of the film which in turn relates to the method of manufacture. Humidity measurements show that 99-100 per cent. relative humidity is maintained inside the liners.

Trials carried out some years ago at Davis with Bartletts stored under modified atmospheres showed that colour retardation was directly related to the CO_2 content of the atmosphere. Above 5 per cent. CO_2,

Fig. 33—A citrus nursery in the Coachella Valley raising over a million Troyer Citrange seedlings

original polythene packs were sealed with the purpose of increasing storage life. However, damage from high levels of CO_2 has introduced too great a risk and liners are now partially ventilated. One hundred and twenty pin-holes per liner are recommended. The liner is folded over before lidding and the pressure of the pack is relied on to give a partial seal; 5 per cent. CO_2 is considered likely to cause internal browning and the degree of ventilation aims at not more than 3 per cent. CO_2. internal browning could occur. Dropping the oxygen to 2.5 per cent., or 1 per cent. also slowed colouring. The best conditions for storage were between 5 per cent. and 10 per cent. CO_2 and 2 per cent. O_2.

Work is still in progress at Davis on Bartlett pears for canning, dealing with various aspects of maturity, storage and ripening. Ninety days is the normal limit of storage in air but trials have shown this can be greatly increased with C.A. storage.

Fig. 34—Troyer Citrange has proved unsatisfactory for Eureka lemons (right) but has been used successfully for Lisbons (left)

CITRUS

VISITS to citrus areas were confined to California. The majority of the time was spent at the Citrus Experiment Station and the University of California Horticultural centre at Los Angeles but short trips were also made to the Coachella Valley, Ventura and Tulare counties to see something of commercial fruit growing and handling.

California produces between 50 and 60 million bushels of citrus fruits which is approximately 30 per cent. of the United States production. Oranges account for more than two-thirds of the Californian production and comprise 60 per cent. Valencias and 40 per cent. Navels and other varieties. California produces most of the lemons grown in America but grapefruit production is quite small.

The Riverside area is the old centre of the citrus industry in California. Industrialisation is slowly moving in and seems likely to finally engulf this fertile belt of country but it will remain an important centre for many years to come. Production is confined mainly to oranges. This area and further west was seriously affected by Tristeza some years ago and the orchards instead of being replanted have gone over to industrial use.

The Coachella Valley in the far south of the State is a much newer citrus development. It is a desert area with an annual rainfall of about four inches. Climatically it is suited to the production of early fruits. Lemons mature in six months and navel oranges are well ahead of other parts of California and command high prices in the eastern markets. It is also an important centre for grapefruit. Several large nurserymen are established in the Valley and produce vast numbers of trees annually. The soil is very sandy but, with irrigation, excellent growth is obtained.

Ventura county is the lemon centre, producing over 40 per cent. of the Cali-

Fig. 35—Allen nucellar Eureka lemons (right) have outgrown and outyielded old line Eurekas of the same age (left)

fornian lemons. The largest lemon planting is in excess of 1,000 acres. This is a coastal centre and in the milder climate lemons grow remarkably well. Production is in excess of five million bushels with approximately one-fifth of the area still non-bearing.

Tulare county is situated further north and citrus groves are located at the foothills of the Sierra Nevada. This again is a new area developed largely by growers who due to economic pressure have found it necessary to move out of the old recognised citrus regions farther south. Plantings are mainly of oranges and are located on more undulating country than many of the southern areas.

There is a definite trend in America towards increased consumption of citrus juices at the expense of fresh fruit sales. Single-strength chilled juice, concentrates and frozen concentrates are readily available at all supermarkets and self-service stores and are preferred to the fresh product because of ease of serving and uniformity of quality. California however, is a minor supplier of juices compared with Florida and still sends large quantities of fresh fruit to eastern American markets. Considerable quantities are also exported.

Orchards vary very much in size. Many would average 25-30 acres although some large properties go as high as 1,000 acres and more. The smaller orchardist relies to a large extent on contractors for his main operations. Spraying, pruning, cultivating or weed spraying can all be arranged through private contractors. Picking teams will harvest the fruit which is delivered to a central packing shed for handling and disposal. Many of the smaller orchards have little or no equipment. Larger company orchards on the other hand are well equipped with their own packing sheds and sometimes juicing plants.

Low profit making co-operative organisations handle a large proportion of the fruit and arrange marketing. The fruit is handled on a pool basis. Private concerns also buy direct from growers.

ROOTSTOCKS

Citrus growers in California are very rootstock conscious, and radical changes are in progress. This has been brought about by two factors. Firstly, the serious losses caused by the Tristeza virus some years ago and also currently in the Riverside area to oranges worked on sour orange stocks and secondly the extensive work which has been done by the Citrus Experiment Station at Riverside on a wide range of stocks.

Because of the risk of Tristeza, sour orange stock is now only planted in isolated areas in California although in some parts of America it is still widely used. Sweet orange is no longer extensively planted on account of Phytophthora susceptibility and rough lemon has gone out of favour and is only used for some lemons. Cleopatra

mandarin is being used to a limited extent particularly for lemons.

Much more interest is however being taken in Trifoliata stocks and Trifoliata hybrids particularly the Troyer citrange. The industry is clamouring for trees on this stock. This season over half a million seedlings or about half the stocks raised

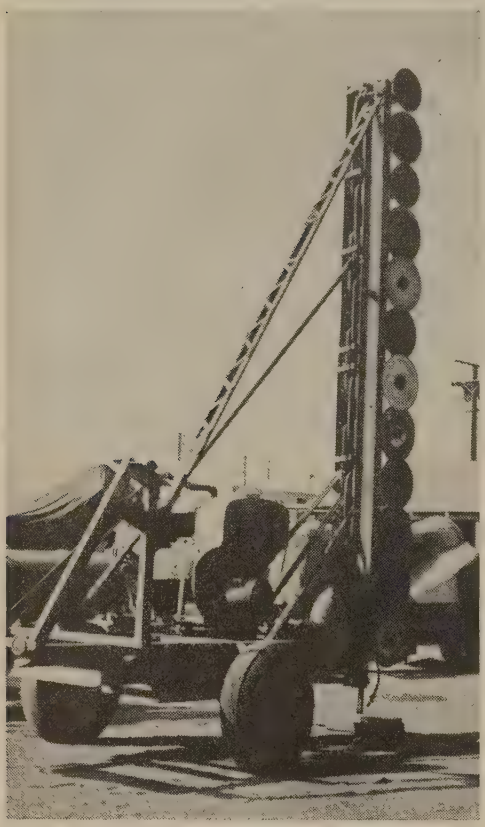

Fig. 36—Mechanical pruning is an established practice in lemon orchards in parts of California. This hedging machine is used to trim the sides of trees once a year

by one of the largest nurserymen will be Troyer and more would be grown if seed were available. Troyer seed is bringing 80 to 100 dollars per quart and in recent years has brought as high as 15 cents per seed. Growers are paying premium prices for trees on this stock usually three to four dollars per tree.

With the exception of Eureka lemons, which are subject to bud union crease virus disease, all trials with Troyer have proved it to be a very satisfactory stock. The oldest trees are oranges at 15 years of age. Tree growth and cropping has proved to be at least 30 per cent. better than trees on sweet orange stock and fruit quality is very good. As a replant Troyer outgrows other stocks due to its greater resistance to citrus nematodes and phytophthora and following fumigation gives excellent results.

Troyer is more susceptible to trace element deficiency than most stocks and also to salinity troubles but less so than Trifoliata. It would also appear to have inherited the Trifoliata characteristic of accentuating rind crinkle in oranges. Butts are much less fluted. Troyer is a satisfactory stock for Lisbon lemons but is unsuitable for Eureka. All scion material must be free from the scaly butt virus. Within a decade the stock position in California has changed from predominantly sweet and sour orange to Troyer citrange and Trifoliata.

Carizzo citrange, a sister to Troyer, also looks very good in trials and has special value on account of its greater resistance to both citrus and burrowing nematodes. It is not yet available for commercial planting.

Other promising stocks being tried in large scale trials are Citremon for oranges and lemons, particularly Eureka, Citromelo, Siamelo and Taiwanica for oranges and Marcrophylla for lemons. Eureka or Macrophylla has out-grown and out-yielded other stocks and may prove very useful for this purpose. Over 4,000 citrus trees mainly oranges, on selected rootstocks were planted in trials last season and more than 7,000 are due to be planted during next season.

Cleopatra mandarin although a good stock is being overshadowed by Troyer. It is rather more difficult to handle in the nursery and also at transplanting but nevertheless has proved very satisfactory both for oranges and lemons.

The vigour of the trees on Trifoliata stocks varies considerably with the strain of Trifoliata used and the stock-scion combination. This is well illustrated in plantings at Riverside. The Rubidoux strain is the one which has been used extensively in trials at Riverside and for which the most information is available.

It produces a well-grown tree but smaller than on sweet orange. A wide selection of Trifoliata strains is being grown at U.C.L.A. for study of growth characteristics.

Valencias on Citronelle have over 32 years yielded as well as Valencia on sweet orange although quality has been poorer

Fig. 37—Recently "hedged" lemon trees. Yields are increased and fruit quality improved

but Washington Navels on Citronelle produced much smaller trees and lower yields. Valencies on their own roots are equivalent to trees propagated on other stocks.

No control of shell bark in lemons by means of rootstock has yet been demonstrated. The only measure which helps alleviate this condition seems to be bud height. A trial is in its first year at Riverside evaluating this factor in relation to various rootstocks. Budding is at 2, 4, 8 and 12 inches from ground level.

NUCELLAR STRAINS

A trial comparing new line (virus free nucellar) Valencias with old line material at Riverside is now nine years old. New line strains have produced larger trees and yielded about twice the amount of fruit. Similar trials on commercial orchards are also giving good results. Olinda, Cutter, Campbell and Frost are some of the strains being used.

Frost Nucellar Eurekas have also outgrown and out-yielded old line Eurekas. Nucellar Lisbons on the other hand although giving a larger tree have failed to produce more fruit. Allen and Cascade are other important nucellar strains of Eureka.

With the development of improved strains of Lisbon lemons such as the Prior, which incidentally is not a nucellar, much more interest has been shown in growing Lisbon. Whereas some years ago 80 per cent. of plantings were Eurekas, now only 50 per cent. are Eurekas and the rest mainly Lisbons. Strains of Lisbons suitable for Troyer or Trifoliata stocks are now also available and will further increase Lisbons plantings. Frost nucellar is the popular choice of Eureka strains but is unsuitable for Trifoliata or its hybrids.

PRUNING

Citrus trees make vigorous growth in California and growers are faced with a problem of crowding which limits fruit set on the lower parts of the tree and hence reduces yields; makes pest and disease control difficult and increases harvesting costs. For years lemons have been regularly pruned, but this has become too costly and time consuming. The answer to the problem has been found in mechanical pruning by means of hedging and topping machines and also pneumatic hand pruners.

Mechanical pruning is an established practice in lemon orchards and is increasing in orange groves. A large section of the 60,000 acres of lemons are now regularly pruned mechanically each year, mainly by contractors. Lemons are normally topped twice each year and hedged once with some hand work occasionally to thin out the heavier wood in the centre of the trees. Oranges on the other hand are only topped and hedged once about every five years with some hand work in between.

The hedging machine consists of a vertical bank of 12 circular saws 14 inches in diameter, slightly over-lapping and revolving at at least 3,000 r.p.m. The power is supplied by a 25 h.p. motor the whole unit being mounted on a truck or tractor trailer. The cost runs about 2,000 dollars (£900). Under normal conditions the machine can travel at about 1½ m.p.h. and cover ¾-1½ acres per hour. For oranges it is usual to hedge two sides one year and the other two sides in the next or subsequent year. Lemons are hedged both ways each year.

The topping machine is rather more complex since it incorporates a hydraulic hoist, boom tilting gear and requires more power. The boom usually carries seven blades each considerably larger than the vertical type. The unit is mounted on a motor truck or similar conveyance. Another type of topping machine consists of four circular saws carried at the ends of cross arms rotating on a central axis. This is built onto a traction unit. A machine of this type might run as high as $16,000 (£9,000). About one acre can be topped per hour.

Hedging normally consists of cutting a laneway six to eight feet wide between rows. Topping may be carried out at any level but 16 feet is considered convenient for mature trees. Usual cuts are up to 1 in. diameter but heavier cuts can be made if necessary. The heavier the cutting the slower the speed of travel. Young lemon trees may be topped as early as four years commencing at a lesser height. Costs for hedging run about 17 cents per tree. Topping is more variable in price and can be more expensive. For lemons the annual cost approximates 35 to 40 dollars per acre as against about 80 dollars for hand pruning.

Hedging and topping may cause a slight depression in yield of oranges in the first year, although not necessarily so, but in subsequent years crops are heavier by as much as 1½ to 2 boxes per tree and fruit size and quality is improved. The best procedure for oranges appears to be to hedge both ways and top over a period of one or two years and follow this up with some hand thinning. Hand thinning can be conveniently carried out with a mechanical squirrel and pneumatic shears and saw. The squirrel is a three-wheeled machine which is readily controlled by the operator perched on a hydraulically-operated platform. With this equipment one man can carry out the work of three men but it is not considered economical for less than 50 acres.

A four-year lemon pruning trial comparing hand pruning with mechanical pruning showed the latter to be more effective and less costly. Yields were greater and the total gain per acre from mechanical pruning amounted to $207.

Hand pruning trials carried out over a period of six years at Riverside have shown the cheapest and most effective way of increasing yields of oranges is to open up the centre of the tree by removing the top, thus letting the light into the tree. Skeletonising one quarter of the tree each year has also proved effective especially for navels. Both these methods eliminate any temporary depression of yield. Complete skeletonising proved very effective but one whole crop is lost. A general light thinning gave the least response, was the most expensive and was little better than just removing dead wood.

Pruning either mechanically or by hand is only recommended for trees with healthy roots.

FERTILISERS

Under normal conditions, nitrogen is the only major element giving any response in tree growth and fruiting and is often the only type of fertiliser used. This is particularly so where weed-free non-cultivation is practised. An application of 2½ to 3 lb. of actual nitrogen is considered the desirable upper limit to avoid adverse effects on fruit quality. A common method of applying nitrogen is in the irrigation water using Anhydrous ammonia or a concentrated solution of ammonium nitrate

or urea. Solutions containing 20 per cent. N are common. The liquid fertiliser is delivered by tankers into farm storage tanks from where it can be fed into the irrigation line thus entirely eliminating the cost of manual handling.

Time of application has been shown to be important. Best cropping has resulted from applications prior to blossoming.

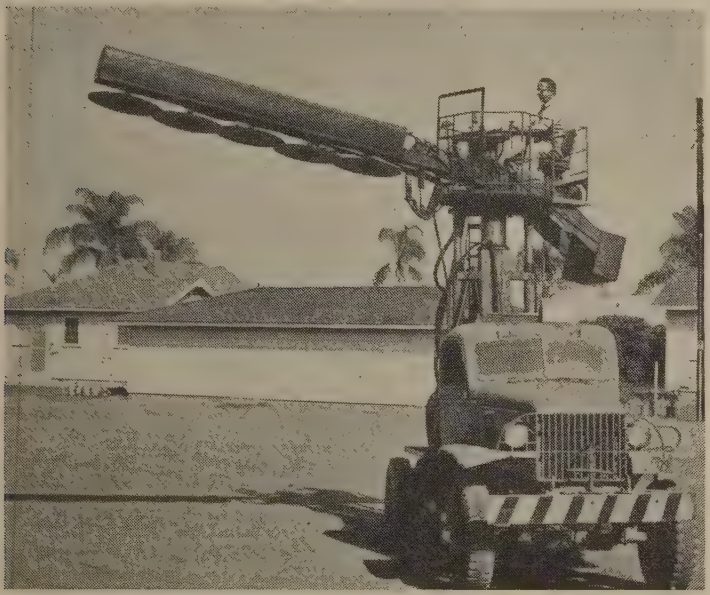

Fig. 38—The topping machine limits the height of the trees and is often used twice yearly on lemons

High nitrogen levels during the early growth of the fruit will not improve yield but can result in abnormal regreening of this fruit during the summer following ripening. Nitrogen applied during midsummer or later can cause undue coarsening of the fruit. Nitrogen fertilisers are cheap, ammonia costing about 7 cents per lb. of nitrogen. Nitrogen as sulphate of ammonia costs about 10 cents per lb.

A long term N.P.K. trial on Washington Navel oranges at Riverside has shown no response whatever to phosphate. Potash produced no measurable effect on yield, although after 20 years some response was noted in increased fruit sizes. Nitrogen produced marked responses according to the amount of nitrogen applied and also the source. Continuous heavy applications of nitrate of soda or sulphate of ammonia reduced yields in comparison with nitrate of lime apparently due partly to a deterioration in soil structure and water infiltration. The best results as regards yields and fruit size were obtained where nitrogen was supplied at the rate of 3 lb. per tree half from an organic source and half from a chemical source with winter cover crops.

For lemons, between 1 lb. and 2 lb. of nitrogen per tree is considered adequate.

Trace element deficiencies are common in many Californian citrus groves. Manganese, zinc, copper and iron are involved. With the exception of iron the deficiencies are readily corrected with foliage sprays.

In recent trials, lemons showing severe iron chlorosis have responded very well to soil application of 50 gms of iron as sequestrienne iron 138, a product of the Geigy Chemical Co. The material is applied in auger holes drilled near the base of the tree. Eureka lemons on citronelle stocks were less affected by iron chlorosis than on sweet orange. Even Eucalypts (E. globulus) planted as a windbreak around one orchard were also showing very definite symptoms.

IRRIGATION

Rainfall in the citrus areas of California ranges from 4 in. in the desert regions to about 16 in. in some coastal districts.

Irrigation is therefore essential to the growing of citrus and ranges from as little as five to six inches on parts of the coast to 10 feet in the Coachella Valley. In the latter area summer temperatures are very high soils are sandy and frequent watering is necessary the year round. Water for the Coachella Valley comes more than 100 miles by irrigation channel from the Colorado River. In other areas much water is obtained from wells. Furrow irrigation is common but sprinklers are also used. In one area with heavy clay soils low volume sprinklers putting out only about 3 in. in 24 hours are being used to overcome the difficulty of slow penetration. It is common practice to add gypsum to water from the Colorado River.

Long-term irrigation trials with navel oranges have shown reduction in yields of up to 30 per cent. under conditions of limited irrigation even though tree growth and vigour are only slightly affected.

Current work entails the use of tensiometers for maintaining soil moisture levels within definite limited ranges. Many growers are also using tensiometers as a guide to irrigation. Instruments are available at $10 to $15 each. Some growers are constructing their own from purchased parts.

The recommended procedure is to have two instruments in at least three sites in the orchard. The instruments to be placed in—

(a) the upper feeding root zone;

(b) at a depth to encompass approximately 80 per cent. of the roots.

Early in the season, irrigations are gauged on the shallow instruments as most of the draw will be from the surface layers. A close watch is kept on the deep instrument and when it starts to show a definite rise in readings heavier irrigations should be applied to replenish moisture losses in the deeper zones.

Tensiometers give a picture of the moisture extraction pattern, and thereby provide a useful check on irrigation. They do not provide an absolute measure of soil moisture content.

HERBICIDES

Weed oils are being used extensively in citrus orchards. They are diesel type oils with dinitro or pentachlorphenol additives.

Monuron.—Of the chemical herbicides used commercially 2,4,D (amine) is being used at 12 to 16 oz. per acre as a spray to wet the foliage only and monuron at 2 lb. of commercial formulation (80 per cent. active ingredient) per acre as a soil sterilant. The latter does not control nut grass or Johnson grass.

Fig. 39.—Oranges are only pruned mechanically every five years. In between, some thinning out is advisable and this is often done with a mechanical "squirrel"

A number of other chemicals are under trial.

Dalapon.—At 1 lb. per 100 gallons applied at three to four week intervals three or four times during the summer is proving effective. Dalapon can cause injury to citrus when sprayed on the foliage and at 8 lb. per acre it has caused complete fruit drop.

Amino Triazole.—At 4 to 8 lb. per 100 gallons applied to wet the foliage is not as effective as Dalapon but is safer and has been used up to 16 lb. per acre without damage.

Simazin.—At 2 lb. per acre appears as effective as monuron and remains active longer.

None of these three herbicides are as yet registered for use on citrus.

NON-TILLAGE

There has been a definite trend since the war towards weed-free non-tillage in Californian citrus groves, controlling weeds by oil sprays or herbicides. In Ventura it was estimated that 50 per cent. of the area is now under non-tillage, the rest being divided equally between barley and other cover crops and volunteer weeds with summer cultivation. The advantages of non-tillage have been listed as follows:—

(1) Increased water penetration by improving tilth of soil.
(2) Better root growth. The feeder roots use the full volume of soil and are not cut off by discing.
(3) Greater accessibility into orchards.
(4) Conservation of organic matter.
(5) Less frost hazard.
(6) Easier rodent control.
(7) Less erosion.

It must be remembered that the annual rainfall is quite low in many areas, being 12 inches or less.

Oil sprays have been most generally used and in the initial stages of changing to non-tillage frequent sprays are necessary to control major weed growth. As the bank of weed seeds in the soil is reduced, less frequent applications are necessary and eventually only spot spraying is required. Weed control using oil is expensive in the initial stages but maintenance costs are low. All above-ground weed parts are killed but some perennial weeds will continue to grow and require constant attention.

More recently monuron has been recommended as an effective and cheaper means of destroying weeds. It acts as a soil sterilant and when applied at the rate of 2 lb. of commercial formulation per acre of ground actually treated it remains toxic to germinating weed seeds for a period of two to eight months. It is gradually broken down by bacteria and also lost by leaching. It is not effective on established weeds and certain weed species develop resistance to the chemical soon after germination. Some spraying may therefore be necessary with oil or another herbicide such as dalapon.

The recommended procedure is to apply monuron first in the autumn, follow this by a second spray in the early spring and probably a third the following autumn.

Fig. 40—Pumps and irrigation line with fertiliser being fed into the water stream from the conical applicator seen in the background

Fig. 41—Weed-free non-cultivation is becoming popular in California citrus groves. The self-propelled plant is being used to spray weeds in a newly-planted orchard

Further treatment will depend on circumstances.

Comparative cost figures for monuron, oil and normal cultivation have been quoted as follows:—

	Monuron.	Oil.	Cultivation.
1st year	$16.20	$60.00	$27.23
2nd year	$14.65	$35.00	$27.23

Monuron is toxic to citrus at higher dosages and care is necessary to ensure the chemical is accurately applied.

NEMATOCIDES AND THE REPLANT PROBLEM

D.D. or Telone are recommended preplant treatments for citrus and their use is now commonplace. E.D.B., Nemagon and also methyl bromide can cause damage to young trees even after normal aeration and are not recommended as replant fumigants. Nemagon should not be used on trees less than five or six years of age. Oranges set as replants in old citrus soil have made much improved growth after D.D. fumigation of the planting holes and yielded up to 40 per cent. more fruit. The practice being adopted in one large citrus orchard is to grow beans for two years after removal of the old trees then fumigate with D.D. and grow beans for another year before replanting. Young orange trees planted under this system were making very good growth at 17 months. A definite response had also been obtained with replant lemons after fumigation.

Nemagon treatment of existing mature orchards has also produced worthwhile results. Using from 2½ to 5 gallons of actual Nemagon per acre according to soil type, a strip 10 to 12 ft. wide between the rows is treated 7-8 in. deep. Improvement in yield up to 10 per cent. (increase from 10 to 11 bushels) has resulted after two years. It appears that retreatment will be necessary possibly after three to four years. No attempt is made to treat under the trees. With the development of water-dispersible Nemagon, trials are in progress flooding the material on with irrigation water. Applications through sprinklers and applying to the ground to be washed in by sprinkling are also methods being tried. The aim is to obtain a uniform distribution of the fumigant down to the depth of the root zone. Trials are in progress assessing the combination of soil fumigation and pruning.

No method has been found which will completely kill nematodes on tree roots at the time of lifting from the nursery. Insecticides have not generally proved effective and hot water treatment although good is never 100 per cent. Strict inspection of all trees sold by nurserymen for the presence of nematodes has been carried out by the State Department of

Agriculture over the past two seasons and many trees have been destroyed. As a result most nurserymen now fumigate the nurserybeds before planting.

PHYTOPHTHORA ROOT ROT

Phytophthora is widespread in the Riverside area and is being given considerable attention. Heat sterilisation treatments for Phytophthora citrophthora consist of hot water treatment of the seed at 120 to 125° F. for five minutes and also immersing the roots of young trees in water at 118° F. for ten minutes. In the field, vapam at the rate of 1 pint per 8 ft. diameter basin has been used as a replant treatment. Six inches of water are applied to ensure adequate soil penetration and six weeks is allowed to elapse before planting. Trials in progress for two years show growth of treated trees is much superior. The cost of material is about 30 dollars per acre. Complete soil treatment would run into approximately ten times this figure and is not feasible. Vapam and also mylone have been applied to the soil and watered in by sprinkler. Soil drenches of chlorinated water are also being tried around permanent trees.

Various stocks are showing good resistance to both *P. citrophthora* and *P. parasitica*. These include a number of selections of Trifoliata, Citranges and Ichang Pummelo. Cleopatra Mandarin is more susceptible to *P. parasitica* and relatively resistant to *P. citrophthora*.

BREEDING AND IMPROVED STRAINS

The present breeding programme at Riverside is aimed at developing hybrids which are acceptable scion types or of value as rootstocks. This work is of necessity of a long-term nature and the first crosses are only now beginning to fruit. Work is also proceeding with nucellar types and this at present seems the most promising field.

Fig. 42—These 17 months old replant orange trees were planted after a spell of three years of growing beans and after the soil had been fumigated with D.D. Stack burners for frost control (right) are a common sight in Californian orchards.

VIRUS INDEXING

Two main procedures are used at Riverside for indexing citrus material. Firstly for local material in connection with the "variety improvement programme" indexing is aimed at detecting such viruses as stubborn disease, exocortis, xyloporosis, cachexia, psorosis, vein enation, tristeza, seedling yellows and stem pitting. New material is continually being indexed and a close check is also kept on bud lines being used by nurserymen.

The second procedure deals with overseas importations and is far more searching. Basically the aim is to detect any of the viruses listed for local material, plus such additional viruses as Satsuma Dwarf and any other unknown types which may

appear. Imported material is first held at the U.S.D.A. Quarantine Centre at Glen Dale for up to three years before being released to Riverside for detailed indexing.

Both budding and grafting are used in transmissions. An interesting development was seen at the U.C.L.A. station, where cuttings of the test plant and indexing variety were bench grafted and the combination then rooted in a cold frame in a glasshouse. By this means very quick results could be obtained.

HANDLING AND PACKING

Only lemons and grapefruit were seen in the packing houses. All fruit is washed and waxed before despatch to market as there is apparently no market for fruit direct from the orchard. A typical packing house procedure for lemons is as follows:—

(1) Water wash.
(2) Detergent soak.
(3) Water rinse.
(4) Storage wax plus 2,4-D and a mouldicide in some instances.
(5) Colour sorting.
(6) Storage.
(7) Waxing—finish gloss.
(8) Grading.
(9) Sizing.
(10) Carton filling (automatic).
(11) Vibrator—to settle fruit.
(12) Check and add diphenyl pad.
(13) Sealing of carton.

The storage wax is applied to minimise moisture loss. Where storage is not involved, only gloss wax is applied. Colour sorting is done by an electronic spectrophotometer which segregates the lemons into five colour groups. This is valuable for sorting fruit going into store.

All citrus fruits are now packed in cartons (usually telescopic). The rapid place pack is used extensively for oranges and grapefruit but lemons are mainly volume filled. Automatic devices accurately fill each carton to a predetermined count then release it on to a conveyor and replace it by an empty carton.

Vibrators are used to settle the fruit. Cartons then only need a routine check before passing to the sealing machine. Paper impregnated with diphenyl is placed top and bottom of the pack for mould control.

LEMON STORAGE AND COLOURING

Work at Los Angeles has shown that controlled atmosphere storage delays the colouring of lemons and storage was increased from 28 weeks to 41 weeks by this means. It seems likely that storing in sealed polythene possibly with a diphenyl-impregnated pad may be worth investigating.

The colouring of oranges with ethylene is common practice. Early navels are easily coloured with as little as 10 ppm of the gas. Valencias require rather higher dosage up to 50 ppm. Above this concentration there appears to be no increased effect although no harm is caused.

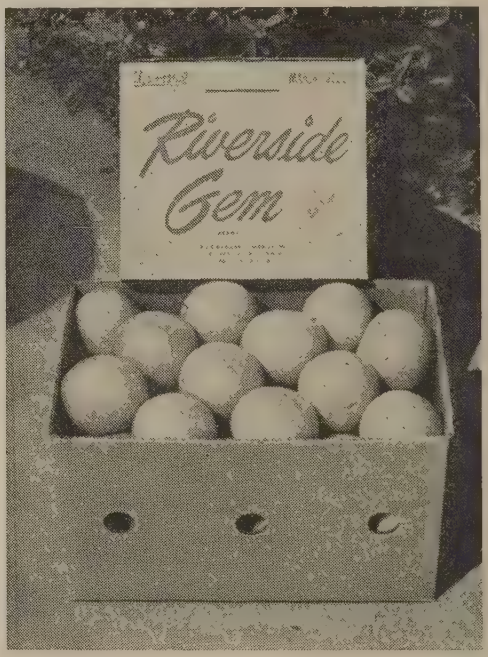

Fig. 43—Rapid-pack grapefruit in a four-fifths bushel carton

Some oranges are coloured with dye in which case this must be stated.

At Riverside the mouldicide value of various ammonium compounds is being investigated also sodium dichloroisocyanurate which releases nitrogen trichloride on wetting.

LIST OF REGISTERED STOCK FOODS AND STOCK LICKS, 1959-60

(By H. G. CARISS, Inspector of Feeding Stuffs)

All foods for stock sold in Western Australia are required by the Feeding Stuffs Act, 1928-1951, to be registered annually with the Department of Agriculture. For the purposes of the Act, "Foods for Stock" includes stock licks, which in turn embrace all preparations claimed to supply or primarily intended to supply mineral matter to stock.

The registration year for stock foods commences on July 1 each year. When making application for registration, manufacturers must submit a guaranteed analysis for each of their products, together with a list of ingredients used in each stock food. Regular inspection and sampling is carried out by officers of the Department to see that stock foods comply with the registered analysis.

Sellers of stock foods are required by the Feeding Stuffs Act, to ensure that to each package is clearly and conspicuously attached a label or brand showing the name and place of business of the manufacturer or importer, the registered brand and name of the food or lick and the registered analysis.

A list of stock foods and stock licks which have been registered for the current registration year appears overleaf.

Before purchasing any food or lick, buyers are advised to consult the list of registered stock foods and stock licks from which a comparison of foods or licks of similar types can be made and also to ensure that packages are correctly labelled. If any doubts arise, inquiries should be made at the Department of Agriculture, where information concerning the provisions and requirements of the Feeding Stuffs Act, and advice on other aspects of stock feeding can be obtained.

Registered Stock Foods . . .

(September 1960)

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis: Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride (NaCl)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
					(Min.) %	(Max.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	%
A.—Simple Foods											
1.—*Meat Meals*											
Meat Meal	1	N.Z.	Burridge & Warren Pty. Ltd.	Animal blood and bone	47·0	8·0	1·6	0·46	....	11·4*	
Do.	27	Watsonia	Watsons Foods Pty. Ltd.	Abattoir offal	27·0	19·7	1·5	....	17·3 15·3	15·5 13·5	
Do.	6	Coogee	Anchorage Butchers Pty. Ltd.	Waste meat products	36·0	18·0	2·0	1·0	12·5 9·0	12·5 8·0	
Do.	100	Midland	Midland Junction Abattoirs	Abattoir offal	55·0	15·0 12·0	2·0				
Do.	3	Star Brand	Fergusons Pty. Ltd.	Meat, green bone, dried blood	50·0	12·0	2·0				
Do.	88	W.A.M.E.	W.A. Meat Export Works	Meat and bone	50·0	13·0	2·0	2·0	12·0 7·0	11·0 6·0	
Do.	283	Waruna	L. H. Rawling	Abattoir offal	50·0	14·0	2·0	....	9·5	13·5 8·0	
Liver Meal	116	Imperial	W. Angliss & Co. Pty. Ltd.	Animal livers and lungs	65·0	20·0	1·0				
2.—*Bone and Meat Meals*											
Bone and Meat Meal	2	Mars Brand....	Fergusons Pty. Ltd.	Green bone	37·0	15·0 12·0	2·0	....	15·0		
Do. do.	37	Apex	E. J. Fry Pty. Ltd.	do.	37·0	12·0	2·0	1·0	15·0 5·0	15·0 5·0	
Meat and Bone Meal	89	T.B. & S.	Thos. Borthwick & Sons Ltd.	Animal offals	45·0	17·0	4·0	2·0	10·0 8·0	9·0 6·0	
Protein, Meat and Bone Meal	115	Imperial	W. Angliss & Co. Pty. Ltd.	Animal meat, bones and livers	50·0	16·0	2·0				
Meat and Bone Meal	222	Thomas	W. Thomas & Co.	Meat and bone	40·0	12·0 9·0	2·0	....	15·0		
3.—*Whale Meal*											
Whale Meal 64%	119	N.W.W.	Nor-West Whaling Co. Ltd.	Humpback whales	64·0	5·0	1·0	1·5 0·5	10·0 7·0	11·0 8·0	
Whale Meal "A"	102	Cheynes Beach	Cheynes Beach Whaling Co. Ltd.	Whale meat and bones	62·0	6·0 4·0	5·0	2·5 1·0	16·0 14·0	15·0 13·0	
Whale Meal "B"	103	do.	do. do. do.	do. do.	56·0	6·0 4·0	5·0	2·5 1·0	16·0 14·0	15·0 13·0	
4.—*Whale Solubles*											
Whale Solubles	119	N.W.W.	Nor-West Whaling Co.	Humpback whales	82·0	0·4	0·1	2·5 0·5	1·5 1·0	1·5 1·0	
Whale Solubles 79%	120	do.	do. do. do.	Baleen whales	79·0	0·4	0·1	2·5 0·5	1·5 1·0	1·5 1·0	

5.—*Fish Meals*										
Crayfish Meal	30	Golden Gleam	Golden Gleam Fish Processing Co. Ltd.	Crayfish offal	40·0	8·0	..	4·5	3·0	11·0	
Cray Meal	4	Ancho	Anchorage Butchers Pty. Ltd.	Waste crayfish products	36·0	12·0 9·0	10·0	3·0 3·5 2·5	1·0 7·0 4·0	7·0 14·0 11·0	
6.—*Milk Foods*											
Buttermilk Powder	31	Watsonia	Capel Dairy Co. Pty. Ltd.	Buttermilk	29·3	7·0	....	1·37*	2·05*	1·05*	Lactose 45
Skim Milk Powder	32	Peters	Peters Creameries Pty. Ltd.	Skim Milk	35·3	0·25	1·0	1·78	2·41	1·29	Lactose 55
Dried Skim Milk Powder	42	Sunny West	Sunny West Co-op Dairies Ltd.	Liquid milk	34·0	2·0	0·5	2·0	3·0	2·0	Lactose 48
Dried Buttermilk Powder	43	do.	do. do. do.	Buttermilk	29·0	11·0 2·0	0·5	1·0 3·0 1·0	2·0 2·5 1·5	1·0 1·5 0·5	Carbohydrates 43·9
Protein Feed Supplement	113	Nutro-Myc	Nutritional Products Pty. Ltd., c/o. Page Boy Products (W.A.)	Based on milk, sugar and skim milk powder	28·0	5·4	11·7	....	2·8*	4·8*	Riboflavin 1·125 mg./oz. Niacin 5·625 mg./oz. Thiamine 1·2 mg./oz. B12 2·5 mg./oz. B. Complex total 144 mg./oz.
Dried Milk Albumen	305	Colac	W. Thomas & Co. ...	Milk by-products	43·0	8·0 3·0					
7.—*Yeast Products*											
Dried Brewers Yeast Extract	175	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.	Brewers yeast	37·0	5·0 2·0					
8.—*Wheat Products*											
Wheat Meal	221	" C " Meal	W. Thomas & Co. (W.A.) Ltd.	Wheat	8·0	....	10·0				
9.—*Oil Seed Meals*											
Pure Linseed Sheep Cakes	170	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.	Linseed meal, molasses	35·0	6·0 3·0	12·0	....	2·0	2·0	
Meggitts Linseed Oil Meal	215	M.L.M.	Elder Smith & Co.	Linseed	33·0	6·0 3·5	10·0		0·5	0·5	
30% Linseed Oil Meal Sheep Nuts	253	Thomas	W. Thomas & Co.	Pure linseed oil meal	30·0	12·0 6·0	12·0				
Linseed Oil Meal	285	Hemphill Gray's	Hemphill Gray Oil Mills	Linseed	30·0	12·0 6·0	12·0				
Rape Meal	284	do.	do. do. do.	Rape seed	30·0	10·0 5·0	13·0				
B.—Compound Foods											
1.—*Molasses Products*											
Proteinised Molasses Block	90	Molacrate	Wm. Haughton & Co.	Magnesium, sulphur, phosphate meat extractive from animal proteins, concentrated whey extract, calcium, cane molasses, potassium, sodium, chlorides, cobalt, iodine, copper	17·5	3·0 *Nil*	....	5·5 4·0	4·5 2·0	4·5 2·0	
Sheep and Cattle Feeding Supplement	300	Proto-Lick	Page Boy Products (W.A.)	Sterilised blood meal and vacuum-treated crude molasses	17·0	5·0 1·5	1·0	1·5 1·0	....	....	CaO 1·0
Dried Concentrate Crude Molasses with Stabiliser (Coconut Meal)	112	Drimolas	do. do. do.	Crude sugar cane molasses (66·5 %), coconut meal (33·5%)	10·6	5·5 2·0	6·6	0·5			
Molassapol	280	Mayco	Maylands Milling Co. Pty. Ltd.	Molasses, bran, pollard	7·5	3·0 2·0	4·0	....	1·0 0·5	1·0 0·4	
2.—*Calf and Cattle Foods*											
Calf Food	101	Harper's Star	Robert Harper & Co.	Wheat, oats, barley, linseed, mustard branning, whiting, salt, peas and condiments	12·0	2·5*	10·0	2·0 1·0	2·5 1·0	1·0 0·25	

* Minimum.

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis: Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride (NaCl)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
					(Min.) %	(Max.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	%
B.—Compound Foods *—continued* *2.—Calf and Cattle Foods—continued*											
20% Protein Vitaminised Antibiotic Calf Food	254	Thomas	W. Thomas & Co.	Linseed meal, coconut meal, pollard, bone flour and/or "Christmas phos," oyster flour, sodium chloride, manganese, sulphate, stabilised iodine, cobalt sulphate, stabilised vitamins A and D_3, antibiotics	20·0	2·5*	8·0	3·0 0·5	2·5 0·2	2·5 0·5	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton Manganese 60 ppm Cobalt 3 ppm Iodine 1·2 ppm
20% Antiobiotic Calf Pellets	255	do.	do. do.	do. do. do.	20·0	2·5*	8·0	3·0 0·5	2·5 2·0	2·5 0·5	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton Manganese 60 ppm Cobalt 3 ppm Stabilised Iodine 1·2 ppm
11% Protein Sweet Dairy Food	256	do.	do. do.	Gristed grains, malt combings, molasses, oyster flour, sodium chloride, manganese sulphate, stabilised iodine, cobalt sulphate, "Christmas phos"	11·0	1·5*	10·0	2·0 1·0	2·5 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm
16% Protein Sweet Dairy Food	257	do.	do. do.	Bran, pollard, gristed grains, malt combins, techn. urea, molasses, oyster flour, sodium chloride, manganese sulphate, stabilised iodine, cobalt sulphate, "Christmas phos"	16·0	1·5*	10·0	2·0 1·0	2·5 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm
20% Protein Sweet Dairy Food	258	do.	do. do.	do. do. do.	20·0	1·5	10·0	2·0 1·0	2·5 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm
11% Sweet Dairy Nuts	259	do.	do. do.	Gristed grains, malt combings, molasses, oyster flour, sodium chloride, manganese sulphate, stabilised iodine, cobalt sulphate, "Christmas phos"	11·0	1·5	10·0	2·0 1·0	2·5 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm
16% Protein Sweet Dairy Nuts	260	do.	do. do.	Bran, pollard, gristed grains, malt combings, techn. urea, molasses, oyster flour, sodium chloride, manganese sulphate, stabilised iodine, cobalt sulphate, "Christmas phos"	16·0	1·5	10·0	2·0 1·0	2·5 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm
20% Preotein Sweet Dairy Nuts	261	do.	do. do.	do. do. do.	20·0	1·5	10·0	2·0 1·0	2·5 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm
32% Dairy Cake Concentrate	262	do.	do. do.	Linseed and/or peanut meal, coconut meal, whale meal, techn. urea, pollard, oyster flour, sodium chloride, manganese sulphate, "Christmas phos," stabilised iodine cobalt	32·0	1·5	5·0	5·0 2·0	8·5 3·5	9·0 4·0	Manganese 60 ppm Iodine 10·2 ppm Cobalt 30 ppm

25% Beef Fattening Cubes	263	do.	do.	do.	Grain meals, oil meals, pollard, techn. urea, molasses, "Christmas phos," sodium chloride, manganese sulphate, stabilised iodine, cobalt sulphate	25·0	1·5	10·0	2·0 1·0	2·5 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 2·2 ppm Cobalt 3 ppm
Sweet Concentrate	264	Med-O-Sweet	do.	do.	Grain meals, oil meals, sweetening agents, cobalt chloride (sulphate)	10·0	2·5 0·5	....	....	....	....	Tot. Sugars, 37·8%, equivalent to molasses, 63·0% Cobalt 15 ppm
Calf Meal	163	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.		Pollard, buttermilk, linseed meal, dried yeast, wheat meal, wheat germ, meat meal, limestone, bone meal, antibiotics, stabilised vitamins A and D_3	20·0	5·0 3·0	3·0	2·0 0·5	2·3 1·5	1·5 1·0	Vitamin A 5,000 I.U./lb. Vitamin D_3 1,000 I.U./lb.
Baby Calf Milk	164	do.	do.	do. do.	Milk solids, dried brewer's yeast, ground hulled oats, vitamins A, D_3 and E, antibiotics	30·0	1·0 1·0	2·0	2·0 1·0	1·5 1·5	0·9	Vitamin A 8,000,000 I.U./ton Vitamin D_3 1,600,000 I.U./ton Vitamin E 12,500 I.U./ton
11% Sweetened Dairy Meal	165	do.	do.	do. do.	Bran, pollard, oat meal, meat meal, bone meal, limestone, salt, molasses, barley meal, ground phosphate rock	11·0	5·0 2·0	10·0	2·0 0·5	2·0 0·5	2·5 0·5	Copper (trace) Cobalt (trace)
16% Sweetened Dairy Meal	166	do.	do.	do. do.	Bran, pollard, wheat germ, linseed, oat meal, molasses, barley meal, rolled wheat, meat meal, bone meal, limestone, salt, ground rock phosphate	16·0	5·0 2·0	10·0	2·5 1·0	3·5 0·5	2·5 0·5	
Stud Stock Cattle Concentrate	167	do.	do.	do. do.	Cotton seed meal, peanut meal, meat meal, barley meal, molasses, rock phosphate, ground limestone	30·0	5·0 2·0	10·0	1·5 0·5	2·0 1·0	3·0 1·0	
Calf Food	16	Western	David Gray & Co.		Malt, grains, milk powder, yeast, whale solubles, pollard, wheat, cereals and trace elements	16·0	6·0	7·5	1·5 0·5	1·5 0·5	1·0 0·15	
Lin Meal	17	do.	do.	do.	Malt, grains, linseed meal, yeast, whale solubles, pollard, wheat cereals and trace elements including cobalt chloride, copper sulphate and manganese sulphate	20·0	7·0	5·0	1·5 0·5	1·0 0·015		
Calf Food 20%	50	Millers	W. H. Milne & Co.		Semolina, wheat meal, pollard, meat meal, skim milk, ground limestone, salt	20·0	5·0 2·5	4·0	1·0 0·5	1·5 0·5	4·0 1·0	Vitamin A 9,000,000 I.U./ton Vitamin D_3 3,600,000 I.U./ton
16% Dairy Meal	52	do.	do.	do.	Bran, pollard, oats, barley, malt combings, linseed meal, meat meal, ground limestone, salt	16·0	5·0 3·0	10·0	1·0 0·5	2·5 0·5	3·0 1·0	Copper (trace) Cobalt (trace)
20% Dairy Meal	51	do.	do.	do.	do. do. do.	20·0	5·0 2·0	10·0	1·0 0·5	2·5 0·5	3·0 1·0	do.
Calf Food	202	P.P.	Picton Produce Co.		Oat meal, pollard, linseed, buttermilk, Apac	18·0	5·0 3·0	7·5	0·5 0·2	0·3 0·2	0·4 0·2	do.
Dairy Food (High Energy)	203	do.	do.	do.	Oat meal, bran, pollard, linseed, barley meal, salt, bone meal, calcium, molasses	11·0	4·0 3·0	12·5	0·7 0·4	0·3 0·1	0·3 0·1	do.
Calf Food	287	Eve-Lyn	Tropical Traders Ltd.		Gristed wheat, barley, rye, pollard, linseed, salt, sugar, chalk, tumeric, sodium bi-carbonate, cream of tartar, foenngreek coriander, copper sulphate, bole armenian	8·5	2·0*	3·86	3·5 2·5	1·25 0·25	1·0 0·2	Carbohydrates 66·45 Sulphur (max.) 1·75
Cattle Food	288	do.	do.	do. do.	Gristed wheat, barley, rye, pollard, salt, limestone, chalk, animal charcoal, molasses, sulphur, sulphate of iron, copper sulphate, medicinal herbs	5·0	2·0 1·0	5·5	13·0 12·0	4·25 3·25	9·5 8·5	Sulphur 3·6

* Minimum

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis: Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride ($NaCl$)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
					(Min.) %	(Max.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	%
B.—Compound Foods —*continued*											
2.—*Calf and Cattle Foods—continued*											
Sweet Dairy Food	298	Brownes	Brownes Dairy Ltd.	Bran, pollard, grain meals, brewers grains, phosphate, urea, molasses, lime, salt, calcium, cobalt, stabilised iodine	16·0	5·82 5·0	14·9	2·0 1·0	2·5 1·0	4·0 1·0	
3.—*Sheep Foods*											
30% Protein Linseed Sheep Cubes	169	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op Ltd.	Linseed meals, pollard, molasses	30·0	6·0 3·0	12·0	....	2·0 0·5	2·0 0·5	
Pure Linseed Sheep Cubes	170	do.	do. do. do.	Linseed meal, molasses	35·0	6·0 3·0	12·0	....	2·0 0·5	2·0 0·5	
Summer Sheep Cubes	171	do.	do. do. do.	Bran, clover meal, gristed grains, linseed meal, molasses, techn. urea, dried whale solubles, ground phosphate, rock salt, copper sulphate, cobalt chloride	17·0	2·0 1·5	14·0	1·0 0·5	1·0 0·5	1·0 0·5	Copper 30 ppm Cobalt 7 ppm
Stud Breeders Sheep Cubes	172	do.	do. do. do.	Bran, clover meal, gristed grains, linseed meal, whale meal, peanut meal, urea, molasses, ground phosphate, rock, ground limestone, salt, vitamins A and D_3, cobalt chloride, copper sulphate	20·0	2·0 1·5	10·0	1·0 0·5	1·0 0·5	1·5 1·0	Vitamin A 5,500,000 I.U./ton Vitamin D_3 1,100,000 I.U./ton Copper 30 ppm Cobalt 7 ppm
11% Protein Vitaminised Maintenance Sheep Nuts	251	Thomas ..	W. Thomas & Co.	Bran, pollard, grain meals, molasses, oyster flour, sodium chloride, vitamins A and D_3, "Christmas phos"	11·0	1·0	15·0	2·0 1·0	2·0 0·5	3·5 1·5	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton
21% Protein Vitaminised Ewe, Lamb and Breeders Nuts	252	do.	do. do.	Oil meals, bran, pollard, techn. urea, grain meals, molasses, oyster flour, salt, vitamins A and D_3, "Christmas phos"	21·0	2·0	11·5	4·0 2·0	3·0 1·0	4·0 2·0	do. do.
Ewe and Lamb Sheep Nuts	286	Western	Hemphill Gray Oil Mills	Linseed oil meal, rape meal, gristed grains, bran, pollard, molasses, urea, salt, calcium phosphate, cobalt, sulphate	21·0	2·0	11·5	5·0 2·0	4·0 2·0	3·0 1·0	Cobalt trace
"Solids" for Sheep	207	Min-A-Vit	Min-A-Vit Pty. Ltd.	Coconut meal, wheat germ, malt combings, meat meal, crushed wheat, min-a-vit sheep pack	14·0	3·0	6·0	1·6	5·24	(CaO) 10·8	Magnesium Oxide 0·92
"Solids Plus" for Sheep	208	do.	do. do.	do. do. do.	14·0	3·0*	6·0	1·6	5·24	10·8	do. do.
4.—*Poultry Foods*											
Laying Mash No. 1	7	Wrights ..	Wrights Ltd.	Bran, pollard, wheat meal, meat meal, whale meal, bone meal, gristed oats, oyster flour, salt, lucerne meal	16·0	6·0 3·0	7·0	1·5 0·75	3·0 1·0	3·5 1·0	
Vitamin A and D_3 Fortified Laying Mash No. 1	8	do.	do.	do. do. do.	16·0	6·0 3·0	7·0	1·5 0·75	3·0 1·0	3·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 6,000,000 I.U./ton

Chick Starter	11	Symonds	E. Symonds	Bran, pollard, cereal meals, wheat germ, meat meal, whale meal, lucerne pollard, bone flour, "Christmas phos," oyster flour, riboflavin, antibiotics, milk powder, manganese sulphate, stabilised vitamins A and D_3 and K coccidiostat	18·0	2·5*	6·0	1·5 0·25	3·0 1·0	2·5 1·0	
Laying Pellets	9	do.	do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, "Christmas phos," manganese sulphate	16·0	2·5*	6·0	2·0 0·25	3·5 1·0	3·75 1·0	
Laying Mash	10	do.	do.	do. do. do.	16·0	2·5*	6·0	2·0 0·25	3·5 1·0	3·75 1·0	
Growers Mash	12	do.	do.	Bran, pollard, gristed grains, wheat germ, meat meal, whale meal, oyster flour, stabilised vitamins A and D_3, riboflavin, "Christmas phos," manganese sulphate	15·0	2·5*	6·0	1·0 0·5	3·5 1·0	3·75 0·5	Vitamin A 5,000,000 I.U./ton Vitamin D_3 1,500,000 I.U./ton
Layers Mash	33	Jubilee	Jubilee Poultry Farm	Wheat, bran, whale meal, Apac, oyster flour, bone meal, auromycin	15·0	2·3 1·8	3·4	0·34 0·31	2·70 2·61	2·51 2·48	
Growers Mash	34	do.	do. do.	Wheat, bran, whale meal, apac, bone meal, auromycin	15·0	1·9 1·2	2·8	0·38 0·22	3·0 2·67	2·48 1·6	
Chick Starter Mash	35	do.	do. do.	Wheat, bran, whale meal, dried milk, yeast, bone meal, apac, auromycin	16·0	1·9 1·7	3·5	0·4 0·38	2·67 2·60	2·48 1·5	
Laying Mash No. 1	36	Gardners	Gardner Bros.	Bran, pollard, wheat meal, meat meal, barley, oats, whale meal, lucerne, rape meal, shell dust, salt, phosphate rock, manganese sulphate	16·0	5·0 3·0	6·0	1·5 0·05	3·0 1·0	3·0 1·0	
Chick Starter (A and D_3)	38	Apex	E. J. Fry Pty. Ltd.	Bran, pollard, wheat meal, meat meal, bone meal, buttermilk, stabilised vitamins A and D_3, salt, antibiotics, gristed oats, ribon	17·0	3·0*	6·0	1·0 0·25	3·0 1·1	3·0 1·0	Vitamin A 3,000 I.U./lb Vitamin D_3 300 I.U./lb.
Growers Mash (A and D_3)	39	do.	do. do.	Bran, pollard, wheat meal, meat meal, buttermilk, bone meal, stabilised vitamins A and D_3	15·0	3·0*	6·0	1·0 0·25	3·0 1·1	3·0 1·5	do.
Laying Mash	40	do.	do. do.	Wheat meal, bran, pollard, meat meal, bone meal, oyster flour, whale meal	16·0	3·0*	6·0	1·0 0·25	2·0 1·1	3·0 2·0	
Laying Mash (A and D_3)	41	do.	do. do.	Wheat meal, bran, pollard, meat meal, bone meal, oyster flour, whale meal, stabilised vitamins A and D_3	16·0	3·0*	6·0	1·0 0·25	3·0 1·1	3·0 2·0	do.
Chick Starter Crumbles 18%	53	Millers	W. H. Milne & Co.	Bran, pollard, wheat meal, oats, barley, wheat germ, meat meal, whale meal, milk powder, salt, lucerne, manganese sulphate, vitamins A and D_3	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 2·0	Vitamin A 4,800,000 I.U./ton Vitamin D_3 1,440,000 I.U./ton Ribon 5 gm./ton Pant. Acid 5 gm./ton Bascitracian 4 gm./ton Proc. Penicillin 4 gm./ton
Chick Starter Granules 18%	54	do.	do. do.	do. do. do.	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 2·0	do. do.
Chick Starter Mash 18%	55	do.	do. do.	do. do. do.	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 2·0	do. do.
(Chick Builder) Growers Mash 15%	56	do.	do. do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne, shell dust, salt, manganese sulphate, vitamins A and D_3	15·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	3·0 1·0	Vitamin A 4,800,000 I.U./ton Vitamin D_3 1,140,000 I.U./ton

* Minimum.

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my irrigation
with 'FIBROLITE'?

That's a question many a property owner has turned over in his mind.

And finally said yes!

Everyone knows you don't extend irrigation for nothing; it *does* cost money. And therefore it needs careful thought.

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'Fibrolite' Pipes
ASBESTOS-CEMENT

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis: Crude Protein (Min.) %	Crude Fat (Max.) (Min.) %	Crude Fibre (Max.) %	Sodium Chloride (NaCl) (Max.) (Min.) %	Phosphoric Acid (P_2O_5) (Max.) (Min.) %	Calcium (Ca) (Max.) (Min.) %	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value %
B.—Compound Foods *—continued*											
4.—Poultry Foods—continued											
Fattening Pellets 13%	57	Millers	W. H. Milne & Co.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne, shell dust, salt, manganese sulphate, vitamins A and D_3	13·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	3·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 2,400,000 I.U./ton
Fattening Mash 13%	58	do.	do. do.	do. do. do.	13·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	3·5 1·0	do. do.
Breeders Pellets 18%	59	do.	do. do.	Bran, pollard, wheat meal, oats, barley, wheat germ, meat meal, whale meal, lucerne, salt, shell, dust, phosphate rock, milk powder, manganese sulphate	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	Ribon 5 gm./ton
Breeders Mash 18%	60	do.	do. do.	do. do. do.	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	Ribon 5 grm./ton Vitamin A 9,000,000 I.U./ton Vitamin D_3 3,600,000 I.U./ton
Growers Pellets 15%	61	do.	do. do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne, shell dust, salt, manganese sulphate, vitamins A and D_3	15·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	Vitamin A 4,800,000 I.U./ton Vitamin D_3 1,440,000 I.U./ton
Broiler Starter Mash 20%	62	do.	do. do.	Wheat meal, barley, whale meal, meat meal, wheat germ, skim milk, lucerne, salt, manganese sulphate, vitamins A and D_3	20·0	7·0 3·0	4·0	1·0 0·5	2·5 1·0	3·0 11·0	Vitamin A 4,800,000 I.U./ton Vitamin D_3 1,440,000 I.U./ton Ribon 5 grm./ton Pant. Acid 1·2 grm./ton Bascitracian 4 grm./ton Proc. Penicillin 4 grm./ton
Broiler Starter Crumbles 20%	63	do.	do. do.	do. do. do.	20·0	7·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	do. do.
Broiler Finisher Mash 18%	64	do.	do. do.	Pollard, wheat meal, barley, whale meal, meat meal, skim milk, lucerne, salt, manganese sulphate, vitamins A and D_3	18·0	7·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	Vitamin A 4,800,000 I.U./ton Vitamin D_3 1,440,000 I.U./ton Proc. Penicillin 4 grm./ton Bascitracian 4 grm./ton
Broiler Finisher Crumbles 18%	65	do.	do. do.	do. do. do.	18·0	7·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	do. do.
Cockerel Starter Mash 18%	66	do.	do. do.	Bran, pollard, wheat meal, oats, barley, meat meal, whale meal, milk powder, wheat germ, lucerne, salt, manganese sulphate, vitamins A and D_3	18·0	5·0 3·0	7·0	1·0 0·5	2·5 0·5	3·0 1·0	do. do.
Cockerel Starter Crumbles 18%	67	do.	do. do.	do. do. do.	18·0	5·0 3·0	7·0	1·0 0·5	2·5 0·5	3·0 1·0	do. do.

Cockerel Finisher Mash 18%	68	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, meat meal, whale meal, lucerne, salt, manganese culphate, vitamins A and D_3	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	Vitamin A 4,800.000 I.U./ton Vitamin D_3 1,440,000 I.U./ton
Cockerel Finisher Crumbles 18%	69	do.	do.	do.	do. do. do.	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	do. do.
Cockerel Finisher Pellets 18%	70	do.	do.	do.	do. do. do.	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	
Laying Mash No. 1 20%	71	do.	do.	do.	Bran, pollard, wheat meal, mixed grain, meat meal, whale meal, lucerne, shell dust, salt, phosphate rock, manganese sulphate	20·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	5·0 2·0	
Laying Mash 16%	72	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne meal, shell dust, salt, manganese sulphate	16·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	3·5 2·0	
Laying Mash 16% A and D_3	73	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne meal, shell dust, salt, manganese sulphate, vitamins A and D_3	16·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	3·5 2·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 2,400,000 I.U./ton
Laying Mash 16% A and D_3 (Special No. 1)	74	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne meal, shell dust, salt, manganese sulphate, vitamins A and D_3, rye	16·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	3·5 2·0	do. do.
Laying Mash 16% A and D_3 (Special No. 2)	75	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, rye, whale meal, meat meal, lucerne, phosphate rock, shell dust, salt, manganese sulphate, vitamins A & D_3	16·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	3·5 2·0	do. do.
Laying Mash 18% A and D_3 (Special No. 1)	76	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, manganese sulphate, phosphate rock, lucerne, shell dust, salt, vitamins A and D_3	18·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	4·0 2·0	Vitamin A 9,000,000 I.U./ton Vitamin D_3 3,600,000 I.U./ton
Laying Mash 18% A and D_3 (Special No. 2)	77	do.	do.	do.	do. do. do.	18·0	7·0 3·0	7·0	1·5 0·5	3·0 1·0	4·0 1·0	Vitamin A 9,300,000 I.U./ton Vitamin D_3 2,790,000 I.U./ton
Laying Mash 20% A and D_3 (Special No. 1)	78	do.	do.	do.	Bran, pollard, wheat meal, mixed grain, meat meal, whale meal, lucerne, shell dust, salt, phosphate rock, manganese sulphate, vitamins A and D_3	20·0	5·0 3·0	7·0	1·5 0·5	3·0 1·0	5·0 2·0	Vitamin A 12,000,000 I.U./ton Vitamin D_3 4,800,000 I.U./ton
Laying Pellets 16%	79	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne meal, shell dust, salt, manganese sulphate	16·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 2·0	
Laying Pellets 20%	80	do.	do.	do.	Bran, pollard, mixed grain, meat meal, whale meal, lucerne, shell dust, salt, phosphate rock, manganese sulphate	20·0	5·0 3·0	7·0	1·0 0·5	3·0 1·0	5·0 2·0	
Laying Pellets 16% A and D_3 (Special No. 1)	81	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, rye, whale meal, meat meal, lucerne, phosphate rock, shell dust, salt, manganese sulphate, vitamins A and D_3	16·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 2·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 2,400,000 I.U./ton
Laying Pellets 16% A and D_3 (Special No. 2)	82	do.	do.	do.	do. do. do.	16·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 2·0	do. do.
Laying Pellets 18% A and D_3 (Special No. 1)	83	do.	do.	do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne, shell dust, salt, manganese sulphate, vitamins A and D_3	18·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	4·0 2·0	Vitamin A 9,000,000 I.U./ton Vitamin D_3 3,600,000 I.U./ton

* Minimum.

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis: Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride (NaCl)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
					(Min.) %	(Max.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	%
B.—Compound Foods —*continued* 4.—*Poultry Foods*—*continued*											
Laying Pellets 18% A and D_3 (Special No. 2)	84	Millers	W. H. Milne & Co.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne, shell dust, salt, manganese sulphate, vitamins A and D_3	18·0	7·0 3·0	7·0	1·0 0·5	2·5 1·0	4·0 1·0	Vitamin A 9,300,000 I.U./ton Vitamin D_3 2,790,000 I.U./ton
Laying Pellets 20% A and D_3 (Special No. 1)	85	do.	do. do.	Bran, pollard, wheat meal, mixed grain, meat meal, whale meal, lucerne, shell dust, salt, phosphate rock, manganese sulphate, vitamins A and D_3	20·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	5·0 2·0	Vitamin A 12,000,000 I.U./ton Vitamin D_3 4,800,000 I.U./ton
Laying Pellets 16% A and D_3	86	do.	do. do.	Bran, pollard, wheat meal, oats, barley, whale meal, meat meal, phosphate rock, lucerne meal, shell dust, salt, manganese sulphate, vitamins A and D_3	16·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 2·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 2,400,000 I.U./ton
Laying Mash	91	Parsons	Parsons Pty. Ltd.	Wheat, pollard, bran, whale meal, shell grit, salt, barley oats	16·0	2·5*	6·0	2·0	3·0	3·75	
Special Chick Food	92	do.	do. do.	Wheat, green peas, maize, sorghum seed, shell grit	8·0	1·5 0·5	4·5	0·5	1·0 0·5	4·0 3·0	
Chick Starter Pellets	122	Boans	Boans Ltd.	Bran, pollard, crushed wheat, oat meal, meat meal, buttermilk, bone meal, vitamins A and D_3, antibiotics and nicarbazine	16·0	5·0 3·0	7·0	1·0	2·3 1·2	1·3 0·8	Vitamin A 2,000 I.U./lb. Vitamin D_3 180 chick units/lb. Nicarbazine 0·0125
15% Vitaminised Chick Mash	125	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.	Wheat meal, pollard, ground oats, oat meal, meat meal, bone meal, ground limestone, salt, manganese sulphate, stabilised vitamins A and D_3	15·0	5·0 3·0	7·0	1·0 0·4	2·3 1·0	2·0 0·8	Vitamin A 2,000 I.U./lb. Vitamin D_3 400 I.U./lb.
15% Vitaminised Chick Pellets	126	do.	do. do. do.	do. do. do.	15·0	5·0 3·0	7·0	1·0 0·4	2·3 1·0	2·0 0·8	do.
15% Vitaminised Chick Crumbles	127	do.	do. do. do.	do. do. do.	15·0	5·0 3·0	7·0	1·0 0·4	2·3 1·0	2·0 0·8	do.
17% Vitaminised Chick Mash	128	do.	do. do. do.	Bran, pollard, kibbled wheat, hulled oats, meat meal, peanut meal, buttermilk, yeast, bone meal, stabilised vitamins A and D_3	17·0	5·0 3·0	7·0	1·0 0·4	2·3 1·0	2·0 0·8	do.
17% Vitaminised Chick Crumble	129	do.	do. do. do.	do. do. do.	17·0	5·0 3·0	7·0	1·0 0·4	2·3 1·0	2·0 0·8	Vitamin A 2,000 I.U./lb.
Vitaminised Growers Mash	130	do.	do. do. do.	Bran, pollard, rolled wheat, oat meal, meat meal, bone meal, stabilised vitamins A and D_3	14·0	5·0 3·0	7·0	1·0	2·3 1·2	1·5 1·0	do.
Vitaminised Growers Pellets	131	do.	do. do. do.	do. do. do.	14·0	5·0 3·0	7·0	1·0	2·3 1·2	1·5 1·0	do.
All Mash Pellets	132	do.	do. do. do.	Bran, pollard, rolled wheat, oat meal, meat meal, bone meal and shell dust	16·0	6·0 4·0	7·0	1·0 0·4	3·5 2·0	3·0 2·0	
All Mash	133	do.	do. do. do.	do. do. do.	16·0	6·0 4·0	7·0	1·0 0·4	3·5 2·0	3·0 2·0	

Vitaminised All Mash	134	do.	....	do.	do.	do.	Bran, pollard, oat meal, wheat, barley meal, meat meal, rock phosphate, shell dust, stabilised vitamins A and D_3	16·0	6·0 4·0	7·0	1·0 0·4	3·5 2·0	3·0 2·0	Vitamin A 3,300 I.U. /lb. Vitamin D_3 450 I.U./lb.
Vitaminised All Mash Pellets	135	do.	....	do.	do.	do.	do. do. do.	16·0	6·0 4·0	7·0	1·0 0·4	3·5 2·0	3·0 2·0	do.
Vitaminised Hi-Protein Mash	136	do.	....	do.	do.	do.	Bran, pollard, rolled wheat, meat meal, whale meal, bone meal, shell dust, stabilised vitamins A and D_3	20·0	7·0 3·0	8·0	0·5 0·4	5·0 3·0	5·0 3·0	Vitamin A 5,100 I.U./lb. Vitamin D_3 1,000 I.U./lb.
Hi-Protein Pellets	137	do.	....	do.	do.	do.	Bran, pollard, wheat meal, meat meal, whale meal, bone meal, shell dust, stabilised vitamins A and D_3	20·0	7·0 3·0	8·0	0·5 0·4	5·0 3·0	5·0 3·0	do.
Broiler Starter Crumble	138	do.	....	do.	do.	do.	Wheat meal, peanut meal, pollard, oat meal, barley meal, meat meal, skim milk, buttermilk, yeast, bone meal, aurofac, stabilised vitamins A and D_3	22·0	5·0 3·0	5·0	1·0 0·2	2·3 1·0	2·5 1·0	Vitamin A 3,500 I.U./lb. Vitamin D_3 700 I.U./lb. Auromycin Hydrochloride 25 gr./ton
Broiler Starter Pellets	139	do.	....	do.	do.	do.	do. do. do.	22·0	5·0 3·0	5·0	1·0 0·2	2·3 1·0	2·5 1·0	do. do.
Broiler Finisher Pellets	140	do.	....	do.	do.	do.	Wheat meal, peanut meal, pollard, barley meal, oat meal, meat meal, bone meal, yeast, aurofac, ground limestone, stabilised vitamins A and D_3	20·0	5·0 3·0	5·0	1·0 0·5	2·3 1·0	2·5 1·0	Vitamin A 2,800 I.U./lb. Vitamin D_3 500 I.U./lb. Auromycin Hydrochloride 25 gr./ton
Broiler Finisher Mash	141	do.	....	do.	do.	do.	do. do. do.	20·0	5·0 3·0	5·0	1·0 0·5	2·3 1·0	2·5 1·0	
Vitaminised Cockerel Mash " A "	142	do.	....	do.	do.	do.	Kibbled wheat, bran, buttermilk, brewers yeast, meat meal, whale meal, bone meal, manganese sulphate, antibiotics, stabilised vitamins A and D_3	18·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	Vitamin A 2,000 I.U./lb. Vitamin D_3 400 I.U./lb.
Vitaminised Cockerel Mash " B "	143	do.	....	do.	do.	do.	Kibbled wheat, bran, meat meal, whale meal, bone meal, manganese sulphate, stabilised vitamins A and D_3	18·0	5·0 3·0	7·0	4·0	2·0 1·0	2·0 1·0	do.
Vitaminised Cockerel Pellets " A "	144	do.	....	do.	do.	do.	Kibbled wheat, bran, buttermilk, brewers yeast, meat meal, whale meal, bone meal, manganese sulphate, antibiotics, stabilised vitamins A and D_3, riboflavin	18·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	do.
Vitaminised Cockerel Pellets " B "	145	do.	....	do.	do.	do.	Kibbled wheat, bran, meat meal, whale meal, bone meal, manganese sulphate, stabilised vitamins A and D_3	18·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	do.
Vitaminised Cockerel Crumble " A "	146	do.	....	do.	do.	do.	Kibbled wheat, bran, buttermilk, brewers yeast, meat meal, whale meal, bone meal, manganese sulphate, antibiotics, stabilised vitamins A and D_3, riboflavin	18·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	do.
Breeders and Layers All Mash	147	do.	....	do.	do.	do.	Wheat meal, barley meal, pollard, oat meal, bran, peanut meal, meat meal, yeast, bone meal, shell dust, manganese sulphate, antibiotics, stabilised vitamins A and D_3	18·0	6·0 4·0	7·0	1·0 0·4	2·5 1·7	3·0 2·0	Vitamin A 4,000 I.U./lb. Vitamin D_3 800 I.U./lb.
Breeders and Layers All Mash Pellets	148	do.	....	do.	do.	do.	do. do. do.	18·0	6·0 4·0	7·0	1·0 0·4	2·5 2·7	3·0 2·0	do.
Vitaminised Poultry Breeders Mash	149	do.	....	do.	do.	do.	Bran, pollard, wheat meal, whale meal, meat meal, buttermilk, brewers yeast, bone meal, oyster flour, manganese sulphate, lucerne meal, wheat germ, stabilised vitamins A and D_3	18·0	7·0 5·0	7·0	2·0	4·0 2·0	2·5 1·0	Vitamin A 3,400 I.U./lb. Vitamin D_3 1,000 I.U./lb.

* Minimum.

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis						
					Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride (NaCl)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
					(Min.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) %	%
B.—Compound Foods *—continued* 4.—*Poultry Foods—continued*											
Vitaminised Poultry Breeders Pellets	150	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.	Bran, pollard, wheat meal, whale meal, meat meal, buttermilk, brewers yeast, bone meal, oyster flour, manganese sulphate, lucerne meal, wheat germ, stabilised vitamins A and D_3	18·0	7·0 5·0	7·0	2·0	4·0 2·0	2·5 1·0	Vitamin A 3,400 I.U./lb. Vitamin D_3 1,000 I.U./lb.
Deworming Mash	151	do.	do. do. d9.	Bran, pollard, wheat meal, piperazine adipate, meat meal	16·0	4·0 2·0	7·0	2·0 0·5	2·0 0·1	2·0 0·1	Piperazine adipate 0·3
Deworming Pellets	152	do.	do. do. do.	do. do. do.	16·0	4·0 2·0	7·0	2·0 0·5	2·0 0·1	2·0 0·1	do. do.
Duck Starter and Grower Pellets	153	do.	do. do. do.	Bran, pollard, gristed wheat, wheat meal, skim milk, barley meal, lucerne meal, gristed oats, vitamins A and D_3, B, E, and antibiotics	17·0	5·0 3·0	7·0	5·0	2·5 1·0	2·0 1·0	Vitamin A 5,500 I.U./lb. Vitamin D_3 1,100 I.U./lb. Auromycin Hydrochloride 7·5 grm./ton
Turkey Starter Mash	154	do.	do. do. do.	Bran, pollard, gristed oats, rolled wheat, buttermilk, dried yeast, meat meal, bone meal, stabilised vitamins A and D_3	24·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	Vitamin A 4,000 I.U./lb. Vitamin D_3 800 I.U./lb.
Turkey Starter Pellets	155	do.	do. do. do.	do. do. do.	24·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	Vitamin A 4,000 I.U./lb. Vitamin D_3 600 I.U./lb.
Turkey Growers Mash	156	do.	do. do. do.	do. do. do.	20·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	Vitamin A 4,000 I.U./lb. Vitamin D_3 1,000 I.U./lb.
Turkey Growers Pellets	157	do.	do. do. do.	do. do. do.	2·0	5·0 3·0	7·0	1·0	2·0 1·0	2·0 1·0	Vitamin A 4,000 I.U./lb. Vitamin D_3 600 I.U./lb.
Chick Food	177	H. & C.	Haynes & Clements	Wheat, maize, peas, grit	9·0	3·0 1·5	4·5	....	....	(CaO) 3·0 3·0	
Chick Starter	185	Morlay	R. B. Young Products Pty. Ltd.	Wheat meal, bran, pollard, dried yeast, skim milk powder, shell grit, antibiotics, concentrate, riboflavin, vitamins A and D_3, salt, bone meal	18·0	.... 3·0	5·5	2·0 0·25	3·5 1·0	4·0 1·5	Vitamin A 3,300 I.U./lb. Vitamin D_3 330 I.U./lb.
Chick All Mash Vitamin Fortified	186	do.	do. do. do.	Wheat meal, bran, pollard, meat meal, whale meal, bone meal, oyster flour, skim milk powder, antibiotics, vitamins A and D_3, manganese sulphate	15·0	.... 3·0	6·0	2·0 0·25	3·0 1·0	4·0 1·5	
Growing Mash Vitamin Fortified	187	do.	do. do. do.	Wheat meal, bran, pollard, meat meal, whale meal, bone meal, oyster flour, salt, riboflavin, vitamins A and D_3, minerals, dried yeast	14·0	.... 3·0	5·5	3·0 0·25	3·0 1·0	4·0 1·5	do.

D Mash (Fattening)	188	do. . .	do.	do.	do.	Wheat meal, bran, pollard, meat meal, whale meal, whale solubles, minerals, bone flour, salt	11·0	.... 3·0	5·5	2·0 0·25	3·0 1·0	4·0 1·5	
Laying Mash	189	do.	do.	do.	do.	Wheat meal, bran, pollard, oyster flour, meat meal, whale meal, whale solubles, bone meal, rock phosphate, salt, minerals	16·0	.... 3·0	5·5	2·0 0·25	3·0 1·0	4·0 1·5	
Laying Mash Vitamin Fortified	190	do. ...	do.	do.	do.	Wheat meal, bran, pollard, oyster flour, meat meal, whale meal, whale solubles, bone meal, rock phosphate, salt, minerals, apac	16·0	.... 3·0	5·5 5·5	2·0 0·25	3·0 1·0	4·0 1·5	do.
H.P. Laying Mash 20% Protein Vitamin Fortified	191	do.	do.	do.	do.	do. do. do.	20·0	.... 3·0	5·5	2·0 0·25	3·0 1·0	4·0 1·5	do.
Breeders Mash	192	do.	do.	do.	do.	Wheat meal, pollard, bran, whale meal, meat meal, skim milk powder, dried yeast, bone meal, manganese sulphate, vitamins A and D_3, ribon	18·0	.... 3·0	5·5	3·0 0·25	3·0 1·0	4·0 1·5	do.
Cockerel Mash " A "	193	do.	do.	do.	do.	Wheat meal, buttermilk, bran, meat meal, whale meal, bone meal, vitamins A and D_3, manganese sulphate, antibiotics, salt, ribon, minerals	16·0	.... 3·0	5·5	3·0 0·25	3·0 1·0	4·0 1·5	do.
Cockerel Mash " B "	194	do.	do.	do.	do.	Wheat meal, meat meal, whale meal, bone meal, bran, manganese sulphate, salt vitamins A and D_3	18·0	.... 3·0	5·5	3·0 0·25	3·0 1·0	4·0 1·5	do.
Chick Starter	200	P.P.	Picton Produce Pty. Ltd.			Bran, pollard, wheat meal, oat meal, meat and bone meals, buttermilk, apac, vitamins A and D_3	16·0	4·0 2·5	5·0	0·5 0·2	0·8 0·5	0·75 0·50	Vitamins A and D_3
Laying Mash	201	do.	do.	do.	do.	Bran, pollard, meat meal, wheat meal, oat meal, bone meal, ground lime, salt, apac, vitamins A and D_3	15·0	5·0 3·0	7·0	0·5 0·2	0·75 0·50	0·6 0·5	do. do.
Growell A and D_3	218	Barrow Linton Pty. Ltd.	Barrow Linton Pty. Ltd.			Bran, pollard, rolled wheat, oat meal, meat meal, bone meal, stabilised vitamins A and D_3	14·0	5·0 3·0	7·0	1·0	2·3 1·2	1·5 1·0	Vitamin A 2,000 I.U./lb. Vitamin D_3 400 A.O.A.C. Chick units/lb.
Vitaliser " A," AB–A and D_3	219	do.	do.	do.	do.	Bran, pollard, cracked wheat, oat meal, wheat meal, buttermilk, bone meal, antibiotics, stabilised vitamins A and D_3, riboflavin	15·0	5·0 3·0	7·0	1·0 0·4	2·3 1·0	2·0 0·8	do. do.
Egglayer A and D_3	217	do.	do.	do.	do.	Bran, pollard, rolled wheat, gristed oats, meat meal or whale solubles, bone meal, oyster flour, stabilised vitamins A and D_3	16·0	6·0 4·0	7·0	1·0 0·4	3·5 2·0	3·0 2·0	Vitamin A 3,300 I.U./lb. Vitamin D_3 450 A.O.A.C. Chick units/lb.
18% Protein Antibiotic Vitaminised Chick Starter + C.P.	226	Thomas	W. Thomas & Co. (W.A.) Ltd.			Bran, pollard, cereal meals, wheat germ, meat meal, whale meal, lucerne pollard, bone flour, " Christmas phos," oyster flour, riboflavin, antibiotics, milk powder, manganese sulphate, stabilised vitamins A and D_3 and K, cocicdiostat	18·0	.... 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton
Chicken Grain	227	do.	do.	do.	do.	Wheat, maize, peas, shell grit	9·0	.... 1·5	4·5 6·0	1·0	3·5	3·75	Vitamin A
15% Protein Vitaminised Chick Grower	228	do. ...	do.	do.	do.	Bran, pollard, gristed grains, wheat germ, meat meal, lucerne meal, whale meal, oyster flour, salt, stabilised vitamins A and D_3, riboflavin, " Christmas phos," manganese sulphate	15·0	.... 2·5		0·5	1·0	0·5	5,000,000 I.U./ton Vitamin D_3 1,500,000 I.U./ton

* Minimum.

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis						
					Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride ($NaCl$)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
B.—Compound Foods —*continued* 4.—*Poultry Foods*—*continued*					(Min.) %	(Max.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	%
18% Antibiotic Vitaminised Chick Crumbles + C.P.	229	Thomas	W. Thomas & Co. (W.A.) Ltd.	Bran, pollard, grain meals, wheat germ, meat meal, milk powder, lucerne meal, whale meal, oyster flour, riboflavin, antibiotics, stabilised vitamins A and D_3, bone flour, "Christmas phos," lucerne pollard, manganese, vitamin K, coccidiostat	18·0	.... 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton
16% Protein Laying Mash No. 1 (All Mash)	230	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate, "Christmas phos," salt	16·0	.... 2·5	6·0	2·0 0·25	3·5 1·0	3·75 1·0	
16% Protein Vitaminised Laying Mash No. 1 (All Mash)	231	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate, "Christmas phos," salt, stabilised vitamins A and D_3	16·0	.... 2·5	6·0	2·0 0·25	3·5 1·0	3·75 1·0	do.
16% Protein Laying Pellets No. 1 (All Pellets)	232	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate, "Christmas phos," salt	16·0	.... 2·5	6·0	2·0 0·25	3·5 1·0	3·75 1·0	
16% Protein Vitaminised Laying Pellets No. 1 (All Pellets)	233	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate "Christmas phos," salt, stabilised vitamins A and D_3	16·0	.... 2·5	6·0	2·0 0·25	3·5 1·0	3·75 1·0	do.
20% Protein Laying Mash	234	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate, "Christmas phos," salt	20·0	.... 2·5	6·0	2·0 0·5	7·0 2·0	7·5 2·0	
20% Protein Vitaminised Laying Mash	235	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate, "Christmas phos," salt, stabilised vitamins A and D_3	20·0	.... 2·5	6·0	2·0 0·5	7·0 2·0	7·5 2·0	Vitamin A 12,000,000 I.U./ton Vitamin D_3 3,600,000 I.U./ton
20% Protein Laying Pellets	236	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate, "Christmas phos," salt	20·0	.... 2·5	6·0	2·0 0·5	7·0 2·0	7·5 2·0	
20% Protein Vitaminised Laying Pellets	237	do.	do. do. do.	Bran, pollard, gristed grains, wheat germ, whale meal, lucerne meal, meat meal, oyster flour, manganese sulphate, "Christmas phos," salt, stabilised vitamins A and D_3	20·0	.... 2·5	6·0	2·0 0·5	7·0 2·0	7·5 2·0	do.

24% Broiler Pre-Starter Crumbles + C.P.	238	do.	....	do.	do.	do.	Grain meals, pollard, milk powder, liver meal, lucerne meal, meat meal, whale meal, " Christmas phos," salt, riboflavin, antibiotics, manganese sulphate, coccidiostat, vitamins A and D_3, K, E	24·0	.... 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton
20% Broiler Crumbles B + C.P.	239	do.	....	do.	do.	do.	do. do. do.	20·0	.... 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	do.
22% Broiler Crumbles A + C.P.	240	do.	...	do.	do.	do.	do. do. do.	22·0	.... 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	do.
19% Breeders Pellets	241	do.	....	do.	do.	do.	Bran, pollard, grain meals, whale meal, meat meal, milk powder, liver meal, lucerne meal, " Christmas phos," oyster flour, salt, manganese sulphate, riboflavin, stabilised vitamins A and D_3 and E	19·0	.... 2·5	6·0	1·0 0·5	2·75 1·0	3·75 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,000,000 I.U./ton
15% Protein Vitaminised Growers Crumbles	242	do.	....	do.	do.	do.	Bran, pollard, gristed grains, wheat germ, meat meal and/or whale meal, oyster flour, stabilised vitamins A and D_3, riboflavin, " Christmas phos," manganese sulphate	15·0	.... 2·5	6·0	1·0 0·5	3·5 1·0	3·75 0·5	Vitamin A 5,000,000 I.U./ton Vitamin D_3 1,500,000 I.U./ton
16% Vitaminised Hi-Energy Mash	243	do.	....	do.	do.	do.	Gristed grains, whale meal, meat meal, lucerne meal, oyster flour, " Christmas phos," manganese sulphate, stabilised vitamins A and D_3	16·0	.... 2·5	6·0	1·0 0·25	3·5 1·0	3·75 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton
16% Vitaminised Hi-Energy Pellets	244	do.	..	do.	do.	do.	do. do. do.	16·0	.... 2·5	6·0	1·0 0·25	3·5 1·0	3·75 1·0	do.
18% Vitaminised Hi-Energy Mash	245	do.	....	do.	do.	do	do. do. do.	18·0	.... 2·5	6·0	1·0 0·25	3·5 1·0	3·75 1·0	do.
18% Vitaminised Hi-Energy Pellets	246	do.	....	do.	do.	do.	do. do. do.	18·0	.... 2·5	6·0	1·0 0·25	3·5 1·0	3·75 1·0	do.
18% Turkey Grower Pellets	247	do.	...	do.	do.	do.	Grain meals, pollard, bran, wheat germ, milk powder, lucerne meal, meat meal, whale meal, " Christmas phos," manganese sulphate, antibiotics, riboflavin, vitamins A, D_3, K	18·0	.. 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	do.
24% Turkey Starter Crumbles	248	do.	....	do.	do.	do.	do. do. do.	24·0	.... 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	do.
24% Hi-Level TM5 Booster Crumbles	249	do.	....	do.	do.	do.	Grain meals, pollard, milk powder, liver meal, lucerne meal, meat meal, whale meal, " Christmas phos," salt, riboflavin, antibiotics, manganese sulphate, coccidiostat, vitamins A and D_3, K, E	24·0	.... 2·5	6·0	1·0 0·25	3·0 1·0	2·5 1·0	do.
40% Vitaminised Universal Poultry Concentrate	250	do.	....	do.	do.	do.	Whale meal and/or meat meal and/or fish meal, oyster flour, manganese sulphate, stabilised vitamins A and D_3, riboflavin, trace minerals, milk powder, " Christmas phos "	40·0	9·0	1·5	0·4 0·2	12·5 8·5	20·5 18·5	Vitamin A 40,000,000 I.U./ton Vitamin D_3 4,000,000 I.U./ton B2 12 micrograms/gram
Chick Starter Mash	299	Altona	....	Altona Hatchery		....	Stabilised vitamins A and D_3, bran, pollard, wheat meal, wheat germ, meat meal, whale meal, bone flour, oyster flour, riboflavin	15·0	4·0 2·0	6·0	1·0 0·15	2·5 1·2	1·5 0·5	Vitamin A 3,000 I.U./lb. Vitamin D_3 300 I.U./lb.
Special Chick Starter	272	Mayco	....	Maylands Milling Co		....	Bran, pollard, meat meal, wheat meal, bone meal, shell grit, salt, riboflavin, emulsified fish oil, manganese sulphate	17·0	4·0 3·5	5·0	1·0 0·75	3·0 2·5	3·5 3·0	Manganese sulphate 0·0125
Growing Mash	273	do.	....	do.	do.	....	do. do. do.	15·0	4·0	5·0	1·0	3·0	3·5	do. do.

* Minimum.

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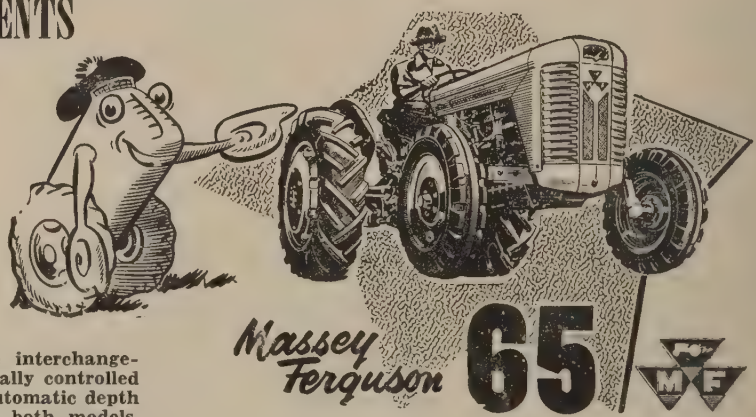

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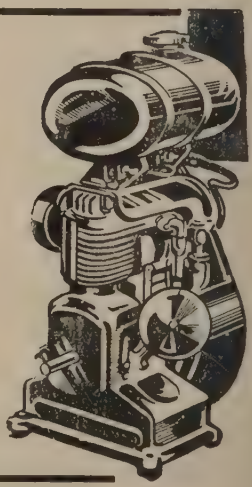

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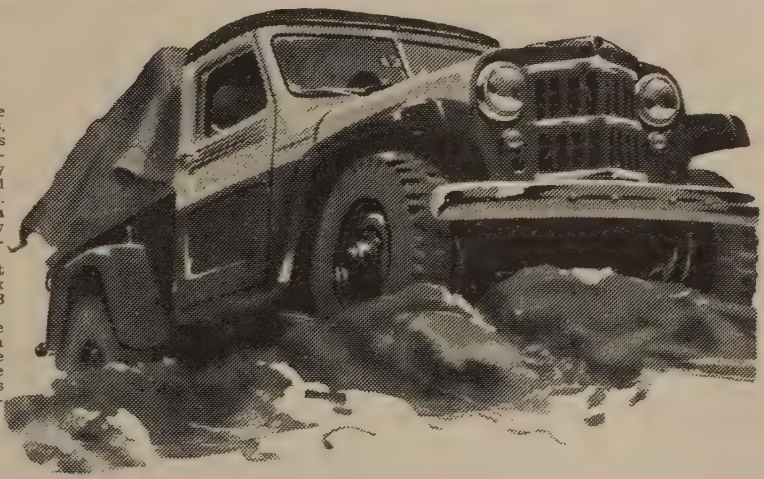

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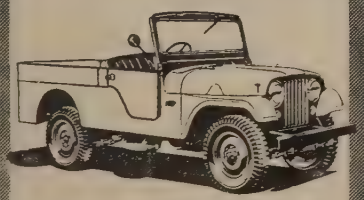

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The all-new Jeep model CJ6 features new styling de-luxe comfort, greater cargo capacity, new smart colours. In a range of new body styles to meet every requirement

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Phone 21 2215 — 21 2216

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis						
					Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride (NaCl)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
					(Min.) %	(Max.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	%
B.—Compound Foods —*continued*											
4.—*Poultry Foods*— *continued*											
Laying Mash	274	Mayco	Maylands Milling Co.	Bran, pollard, meat meal, wheat meal, bone meal, shell grit, salt	16·0	4·0 3·5	5·0	1·0 0·75	3·0 2·5	3·5 3·0	
Special Laying Mash	275	do.	do. do.	do. do. do.	17·0	4·0 3·5	5·0	1·0 0·75	3·0 2·5	3·5 3·0	
Laying Pellets	276	do.	do. do.	do. do. do.	16·0	4·0 3·5	5·0	1·0 0·75	3·0 2·5	3·5 3·0	
Special Laying Pellets	277	do.	do. do.	do. do. do.	17·0	4·0 3·5	5·0	1·0 0·75	3·0 2·5	3·5 3·0	
Broiler "A"	278	do.	do. do.	Wheat meal, bran, meat meal, whale meal, milk, oat meal, pollard, liver meal, cotton seed, molasopol fat, grit, vitamins A and D_2, B_2, E and K, antibiotics, manganese sulphate	20·0	5·0 4·0	4·0	1·0 0·75	0·9 0·8	1·5 1·4	
Broiler "B"	279	do.	do. do. do.	Wheat meal, bran, meat meal, whale meal, oat meal, pollard, liver meal, cotton seed, molasapol, fat, grit, vitamins A and D_2, B_2, E and K, antibiotics, manganese sulphate	20·0	5·0 4·0	4·0	1·0 0·75	0·9 0·8	1·5 1·4	
5.—*Pig Foods*											
Pig Fattening Pellets 13%	46	Millers	W. H. Milne & Co.	Bran, pollard, wheat meal, oats, barley, meat meal, lucerne, salt, phosphate rock, manganese sulphate	13·0	5·0 3·0	7·0	1·5 0·5	3·0 0·5	3·5 1·0	
Pig Fattening Mash 13%	47	do.	do. do.	Bran, pollard, wheat meal, oats, barley, meat meal, lucerne, salt, phosphate rock, manganese sulphate, vitamins A and D_3	13·0	5·0 3·0	7·0	1·5 0·5	3·0 0·5	3·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 2,400,000 I.U./ton Iodine 3 grms./ton Cobalt 2 grms./ton
Pig Grower Pellets 15%	48	do.	do. do.	Bran, pollard, wheat meal, oats, barley, meat meal, whale meal, shell flour, salt, lucerne, manganese sulphate	15·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	
Pig Grower Mash 15%	49	do.	do. do.	Bran, pollard, wheat meal, oats, barley, meat meal, whale meal, shell flour, salt, lucerne, manganese sulphate, vitamins A and D_3	15·0	5·0 3·0	7·0	1·0 0·5	2·5 1·0	3·0 1·0	Vitamin A 4,800,000 I.U./ton Vitamin D_3 1,440,000 I.U./ton
Sow and Weaner Meal	158	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.	Bran, pollard, whale meal, gristed wheat, gristed barley, sterilised bone flour, salt, ground phosphate rock, vitamins A and D_3	18·0	3·0 2·0	6·0	1·0 0·5	2·5 1·5	2·0 1·0	Vitamin A 3,000 I.U./ton Vitamin D_3 600 I.U./ton
Sow and Weaner Pellets	159	do.	do. do. do.	do. do. do.	18·0	3·0 2·0	6·0	1·0 0·5	2·5 1·5	2·0 1·0	do.
Pig Fattening Cubes	160	do.	do. do. do.	Barley meal, pollard, wheat meal, meat meal, bone meal, limestone, stabilised vitamins A and D_3	13·0	3·0 1·0	5·0	1·5 0·5	2·0 1·0	2·0 0·5	Vitamin A 2,000 I.U./ton Vitamin D_3 400 I.U./ton

Pig Fattening Meal	161	do.	do. do. do.	do. do. do.	13·0	3·0 1·0	5·0	1·5 0·5	2·0 1·0	2·0 1·0	do.
Pig Fattening Pellets	162	do.	do. do. do.	do. do. do.	13·0	3·0 1·0	5·0	1·5 0·5	2·0 1·0	2·0 1·0	do.
Pig Mash, Vitamin Fortified (A and D_3)	195	Morlay	R. B. Young Products	Wheat meal, pollard, oyster flour, limestone, rock phosphate, cereal meal, meat meal, whale meal, whale solubles, salt, vitamins A and D_3	14·0	.... 3·0	5·5	3·0 0·25	3·0 1·0	4·0 1·5	Vitamin A 3,300 I.U. /lb. Vitamin D_3 330 I.U./lb.
18% Protein Antibiotic Vitaminised Pig Starter	265	Thomas	W. Thomas & Co.	Pollard, wheat germ, gristed grains, meat meal, whale meal, oyster flour, salt, riboflavin, antibiotics, " Christmas phos," stabilised vitamins A and D_3, manganese sulphate, stabilised iodine	18·0	.... 2·5	6·5	2·0 1·0	3·75 1·0	4·0 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton Manganese 60 ppm Cobalt 3 ppm Stabilised iodine 1·2 ppm
18% Protein Antibiotic Vitaminised Pig Starter Pellets	266	do.	do. do.	do. do. do.	18·0	.... 2·5	6·5	2·0 1·0	3·75 1·0	4·0 1·0	do. do.
14% Protein Pig Fattening Cubes	267	do.	do. do.	Pollard, gristed grains, whale meal, meat meal, oyster flour, salt, manganese sulphate, stabilised iodine, cobalt sulphate, " Christmas phos "	14·0	.... 2·5	6·5	2·0 1·0	3·75 1·0	4·0 1·0	Manganese 60 ppm Cobalt 3 ppm Stabilised Iodine 1·2 ppm
16% Protein Antibiotic Vitaminised Pig Grower Cubes	268	do.	do. do.	Pollard, gristed grains, whale meal, meat meal, oyster flour, salt, antibiotics, stabilised iodine, cobalt sulphate, " Christmas phos "	16·0	.... 2·5	6·5	2·0 1·0	3·5 1·0	4·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton Manganese 60 ppm Cobalt 3 ppm Stabilised Iodine 1·2 ppm
14% Protein Pig Fattening Mash	269	do.	do. do	Pollard, gristed grains, whale meal, meat meal, oyster flour, salt, manganese sulphate, stabilised iodine, cobalt sulphate, " Christmas phos "	14·0	.... 2·5	6·0	2·0 1·0	3·75 1·0	4·0 1·0	Manganese 60 ppm Stabilised Iodine 1·2 ppm Cobalt 3 ppm
16% Protein Antibiotic Vitaminised Pig Grower	270	do.	do. do.	Pollard, gristed grains, whale meal, meat meal, oyster flour, salt, antibiotics, stabilised iodine, cobalt sulphate, " Christmas phos," stabilised vitamins A and D_3	16·0	.... 2·5	6·5	2·0 1·0	3·5 1·0	4·5 1·0	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton Manganese 60 ppm Cobalt 3 ppm Stabilised Iodine 1·2 ppm
Pig Food	291	Eve-Lyn	Tropical Traders Ltd.	Gristed wheat, barley. rye, pollard, salt, limestone, chalk, sulphate, animal charcoal, sulphate of iron, limonite, copper sulphate, corriander, areca nut, foenugreek	5·0	.... 1·0	5·0	9·6 8·6	3·75 3·25	9·5 8·5	
6.—Horse Foods											
Horse Food	289	do.	do. do.	Pollard, barley, wheat, gristed wheat, linseed (whole), salt, chalk, magnesium sulphate, sulphur, sulphate of iron. copper sulphate, sodium bicarbonate, medicinal herbs	8·5	3·0 2·0	7·0	5·0 4·5	1·0 0·5	1·75 0·75	Sulphur 1·25
7.—Dog Foods											
" Vets " Dog Bits	117	Vet-n-ary	Creamota Ltd.	Oats, groats, malted grain, wheat germ, pollard, bone meal, liver, barley, prouned wheat, milk solids, peas, lucerne, meat meal, lucerne meal, fish meal	24·0	6·0 5·0	4·0	0·1 0·07	1·2 0·5	1·7 0·5	Vitamin A 2,000 I.U./lb. Vitamin D_3 300 I.U./lb.

* Minimum.

Stock Food	Applic. No.	Brand	By whom registered	Materials from which made	Registered Analysis: Crude Protein	Crude Fat	Crude Fibre	Sodium Chloride (NaCl)	Phosphoric Acid (P_2O_5)	Calcium (Ca)	Percentages of other substances claimed to be of reputed Medicinal or Nutritive Value
					(Min.) %	(Max.) (Min.) %	(Max.) %	(Max.) (Min.) %	(Max.) (Min.) %	(Max.) (Min.) %	%
B.—Compound Foods—*continued*											
Dog Foods contd.											
Dog Meal	173	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.	Grain meals, bran, pollard, meat meal, dried yeast, butter milk, bone meal, salt, stabilised vitamins A and D_3	20·0	8·0 4·0	5·0	2·0 1·0	2·5 1·0	3·0 1·0	Vitamin A 4000 I.U./lb. Vitamin D_3 700 I.U./lb.
Dog Pellets	174	do.	do. do. do.	Bran, pollard, meat meal, dried yeast, butter milk, bone meal, salt, stabilised vitamins A and D_3	20·0	8·0 4·0	5·0	2·0 1·0	2·5 1·0	3·0 1·0	do. do.
Snaps Special Large ...	196	Snaps ...	Snaps Dog Foods Pty. Ltd.	Wheat meal flour, wheat germ, bone flour, meat meals, whale meal and solubles, milk powder, molasses, iodised salt, vitamins A and D_3	20·0	2·5 2·0	1·5	0·5 0·5	3·0 2·5	3·0 2·5	
Snaps Mixed Shapes	197	do.	do. do. do.	Wheat meal flour, wheat germ, bone flour, meat meals, whale meal and solubles, milk powder, molasses, iodised salt, vitamins A and D_3	20·0	2·5 2·0	2·6	0·6 0·5	3·0 2·5	3·0 2·5	
Snaps Charcoal Shapes	198	do.	do. do. do.	do. do. do.	20·0	2·5 2·0	6·0	0·6 0·5	3·0 2·5	3·0 2·5	
Puppy Meal	199	do.	do. do. do.	Wheat meal flour, wheat germ, bone flour, meat meals, whale meal and solubles, milk powder, molasses, iodised salt, vitamins A and D_3	20·0	4·5 4·0	1·5	0·6 0·5	3·0 2·5	3·0 2·5	
Dog and Cat Food	306	Tucker Box....	Tucker Box Dog and Cat Food Co.	Meat and meat by-products, cereals, vegetables, salt	10·0	5·0 2·0	0·5	1·0			
20% Protein Kanine Kibbles	271	Thomas	W. Thomas & Co.	Predigested cereal meal, wheat germ, grain meal, meat meal, milk powder, molasses, oyster flour, bone flour, salt, potassium iodine, vitamins A and D_3, vitamin B_2	20·0	.... 1·0	1·5	.... 0·5	2·5 0·5	2·5 0·5	Vitamin A 6,000,000 I.U./ton Vitamin D_3 1,800,000 I.U./ton
Dog Food	282	Jonah	Hunts Canning Co.	Crushed wheat and whale meat	21·4	7·5 5·1	0·3	0·27			
Dog Food "Munchies"	294	K9	Zest Manufacturing Co. Ltd.	Yeast, liver, meat meal, cod liver oil, cheese, fish, salt, bone meal, wheat, dried eggs, wheat germ	23·0	7·0 6·0	2·0	4·0			
Dog Biscuits "Fives"	295	do.	do. do. do.	Vegetables, charcoal, chlorophyll	15·0	3·5 2·0	2·0	2·0			
Dog Biscuits "Kibblets"	296	do.	do. do. do.	Meat, fish, cheese, charcoal, liver, vegetable with chlorophyll	15·0	3·5 2·0	2·0	2·0			
Dog Biscuits	297	do.	do. do. do.	Meat, liver, fish, cheese, bone meal, vegetables, salt, charcoal	15·0	3·5 2·0	2·0	2·0			

Stock Food	Applic. No.	Brand	By whom Registered	Materials from which Made	Registered Analysis												
					Sodium Chloride (NaCl)	Phosphoric Acid (P_2O_5)	Lime (CaO)	Magnesia (MgO)	Iron (Fe)	Sulphur (S)	Iodine (I)	Copper (Cu)	Cobalt (Co)	Manganese (Mn)	Potassium (K)	Zinc (Zn)	Other
C.—Stock Licks					% (Max.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	%
1.—Bone Meals																	
Bone Meal	5	Ancho	Anchorage Butchers Pty. Ltd.	Waste meat products	Trace	26·76	26·95	....	....	....	....	....	....	....	....	....	Min. Protein 23·63 Min. Fat 2·44
Bone Meal	26	Watsonia	Watsons Foods Pty. Ltd.	Abattoir offal and bones	....	26·5	36·0	....	....	....	....	....	....	....	....	....	Fibre Trace Protein Min. 14·0
Tricalos Sterilised Bone Grit	28	Tricalos	Davis Gelatine (Aust.) Pty. Ltd.	Bones	....	30·0	40·0	....	....	....	....	....	....	....	....	....	Protein Min. 5
Sterilised Bone Flour	29	do.	do.	do.	....	30·0	40·0	....	....	....	....	....	....	....	....	....	do.
Bone Meal	87	W.A.M.E.	W.A. Meat Export Works	Selected bones	0·25	24·0	27·0	....	....	....	....	....	....	....	....	....	Protein 18·75
Bone Meal	204	P.P.	Picton Produce Pty. Ltd.	do.	0·25	24·0	27·0										
2.—Oyster Flours																	
Oyster Flour	181	Dean's	J. Dean & Son	Oyster shell	0·5	Trace	42·0										
Oyster Flour	224	Thomas	W. Thomas & Co.	do.	1·0	....	42·0										
3.—Mineral																	
Manganese Sulphate	180	Blue Cross	Agricultural Products Co.	Manganese sulphate	....	....	....	....	....	....	....	....	....	22·0			
Cobalt Sulphate	179	do.	do.	Cobalt sulphate	....	....	....	....	....	....	....	....	21·0				
4.—Mineral Phosphate																	
Phosphate Feeding Supplement	223	Thomas	W. Thomas & Co.	Precipitated phosphate	....	36·6	44·8										
5.—Mixed Stock Licks																	
Trace Element Stock Lick	13	Canterbury	Canterbury Stock Feed Manufacturing Co. Pty. Ltd.	Phenothiazine, molasses, vitamins A and D_3, copper, cobalt, zinc, manganese, iodide, tricolos, iron sulphate, magnesium sulphate, meat meal, sulphur, salt, linseed meal, cod liver oil	20·0	12·0	18·0	1·0	2·0	1·5	0·01	0·01	0·01	0·01	....	0·01	Molasses 4 0 Vitamin A 125 I.U./gm. Vitamin D_3 22·5 I.U./gm.
Mineralised Supplement for Stock	14	Rawleighs	The W. T. Rawleigh Co. Ltd.	Salt, sulphur, copperas, sodium phosphate, potassium iodide, calcium carbonate, cobalt, sulphate, de-fluorinated phosphate, mineral oil, molasses and medicinal herbs	15·0	12·24	27·0	....	1,000 ppm	3·5	220 ppm	....	10 ppm	....	80 ppm	....	Calcium 13·42 Sodium 70 ppm
Poultry Powder Iodised	15	do.	do. do.	Oyster shell, sulphur, potassium iodide, copperas, iodine, sulphate, ground bone, manganese sulphate, cobalt, sulphate, zinc sulphate, quassia, de-fluorinated phosphate, mineral oil	....	16·5	38·7	....	400 ppm	4·0	100 ppm	40 ppm	100 ppm	120 ppm	40 ppm	100 ppm	

* Minimum.

Stock Food	Applic. No.	Brand	By whom Registered	Materials from which Made	Registered Analysis												
					Sodium Chloride ($NaCl$)	Phosphoric Acid (P_2O_5)	Lime (CaO)	Magnesia (MgO)	Iron (Fe)	Sulphur (S)	Iodine (I)	Copper (Cu)	Cobalt (Co)	Manganese (Mn)	Potassium (K)	Zinc (Zn)	Other
					% (Max.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	%
C.—Stock Licks—*continued* **5.—***Mixed Stock Licks—continued*																	
Sol-u-min 270	18	David Gray's	David Gray & Co. Ltd.	Copper sulphate, cobalt chloride, urea, mono-ammonium phosphate	....	25·2	....	....	....	....	....	0·6	0·07	....	....	....	Nitrogen 27
Sol-u-min Phosphate 120	19	do.	do.	Mono-ammonium phosphate	....	59·0	....	....	....	....	....	....	....	....	....	....	Nitrogen 12
Sol-u-min C345	20	do.	do.	Cobalt chloride, copper sulphate, urea, ground limestone, iron oxide	....	....	....	....	....	....	....	0·095	0·015	....	....	....	Calcium 7·5 Nitrogen 34·5
Sheep Lick	21	do.	do.	Salt, iron sulphate, copper sulphate, cobalt sulphate, manganese sulphate, potassium iodide, bone meal, yeast	80·0	1·0	5·0	....	1·2	3·3	150 ppm	220 ppm	92 ppm	200 ppm	50 ppm	80 ppm	
Cattle Lick	22	do.	do.	Salt, iron sulphate, copper sulphate, manganese iodide, bone meal, yeast	80·0	1·0	5·0	....	1·2	3·3	150 ppm	220 ppm	92 ppm	....	....	80 ppm	
Sol-u-min Special....	23	do.	do.	Cobalt chloride, mono-ammonium phosphate	....	37·0	....	....	....	....	....	....	1·5				
Sol-u-min 90	24	do.	do.	do. do. do.	....	47·0	....	....	....	....	....	....	0·3	....	....	....	Nitrogen 9
Sol-u-min C88	25	do.	do.	Copper sulphate, cobalt chloride, mono-ammonium phosphate	....	47·0	....	....	....	....	....	2·5	0·3	....	....	....	Nitrogen 8·8
Mineral Food Supplement for Poultry	44	Watkins	Watkins Products Inc.	Calcium carbonate, magnesium carbonate, dicalcic phosphate, bone char, ferric oxide, ferrous sulphate, ground sulphate, salt, mineral, oil, green manganous oxide, cobalt sulphate, copper sulphate, zinc sulphate, potassium iodide	10·5	15·0	33·8	....	1·1	....	0·0153	0·0129	0·01	0·25	....	0·01	Magnesium (Mg) 0·5
Mineral Food Supplement for Stock	45	do.	do.	Dicalcic phosphate, micronised rock, phosphate, calcium carbonate, salt, ferric oxide, ferrous sulphate, ground sulphur, magnesium sulphate, codine, copper, manganese, cobalt, zinc	9·0	15·0	32·0	0·7	1·1	....	0·0176	0·0176	0·01	0·009	....	0·011	
Superex	93	K.C.C.	Kwinana Chemical Co.	Superphosphate	....	30·0	4·0										
Monophos	94	do.	do.	Monosodium phosphate	....	58·0											
Cobalphos	95	do.	do.	Cobalt sulphate, phosphoric acid	....	20·0	....	....	....	....	....	....	5·0				
Aquamin Concentrate	96	do.	do.	Superphosphate, phosphoric acid, copper ore, cobalt sulphate	....	31·0	....	....	....	....	....	0·6	0·1				
Aquamin Double Concentrate	97	do.	do.	Phosphoric acid, copper sulphate, cobalt chloride	....	60·0	....	....	....	....	....	0·4	0·2				
Phosphamin	98	do.	do.	do. do. do.	....	20·0	....	....	....	....	....	1·25	1·25				

Stock Conditioner	09	Luff's Blue Label	Stam Products	Yeast, maize oil meal, caramel, oil of aniseed, boric acid, thiammine hydrochloride, salts of iron, copper, manganese, zinc, cobalt	....	....	....	....	16·46 ppm	....	....	53·3 ppm	49·6 ppm	50·7 ppm		56·4 ppm	Vitamin B_{12} 27,700 I.U./lb.
Super Mindif	104	Boots	Boots Pure Drug Co. (Aust.) Pty. Ltd.	Calcium, phosphorus, copper, iron, cobalt, manganese, iodine, salt, sulphur	30·0	11·4	17·4	....	0·24	0·75	240 ppm	1,800 ppm	300 ppm	510 ppm			
Mindif Salt Lick	105	do.	do.	Calcium, phosphorus, copper, iron, cobalt, manganese, iodine, salt	90·0	0·65	3·4	....	0·35	....	850 ppm	3,000 ppm	300 ppm	170 ppm			
Minorels	106	Blue Peter	Agricultural Products Co.	Ground phosphate rock, ground limestone, limonite, sulphes of minerals, borax	10·0	5·0	20·0	1,200 ppm	4·0	....	....	5,000 ppm	550 ppm	1,000 ppm	....	500 ppm	Borun 200 ppm
Medicated Salt Block "B"	107	do.	do.	Salt, ground limestone, limonite, sulphates of minerals	70·0	....	6·0	....	1·5	....	....	550 ppm	95 ppm	200 ppm			
Medicated Calcium	108	do.	do.	Ground limestone, limonite, sulphates of minerals	1·0	....	45·0	....	3·5	....	....	1,500 ppm	285 ppm	600 ppm			
Complete Trace Vitamin and Mineral Supplement for Layers	109	Nutro-Vitra-min Powder	Page Boy Products (W.A.)	Eggshell meal, bone flour, crude blackstrap molasses, salt, iron, potassium iodine, copper, cobalt, salt, manganese, micro vitamins A and D_3	13·5	22·7	30·3	....	100 ppm	....	10 ppm	50 ppm	50 ppm	2,000 ppm	....	80 ppm	Vitamin A 830,000 I.U./lb. Vitamin D_3 451,000 I.U./lb.
Complete Mineral and Vitamin Supplement	110	do.	do.	do. do. do.	26·2	16·4	29·7	....	0·35	....	80 ppm	600 ppm	100 ppm	170 ppm	....	500 ppm	Vitamin A 180,000 I.U./lb. Vitamin D_3 18,000 I.U./lb.
Complete Mineral Supplement	111	Nutro-Min Powder	do.	Salt, eggshell meal, bone flour, iron, copper, cobalt, manganese, potassium iodine	26·2	16·4	30·6	....	0·35	....	80 ppm	600 ppm	100 ppm	170 ppm	....	50 ppm	
Solidified Molasses Lick	114	Blokmolas	do.	Crude sugar cane, molasses, 75% pulverised limestone, bone meal and fat	3·5	3·7	4·5	....	....	....	....	....	....	....	....	....	Protein 3·5 Calcium 4·5
Denmark Cobalt Lick	121	C.S.M.L.	Cuming Smith Mt. Lyell	Limonite, sulphate of copper, salt	38·0	....	....	....	....	....	....	0·14	20 ppm				
Poultry Spice	123	Day, Son and Hewitt	Boans Ltd.	Wheat offals, spices, mineral salts	1·0	....	10·0	....	2·1	1·2	28 ppm	128 ppm	21 ppm	1,720 ppm	....	....	Min. Protein 3·6 Min. Fat 1·0 Max. Fat 4·8 Max. Fibre 1·9
Iodised Mineral Lick	124	do.	do.	Limestone, flour, sterilised feeding bone, salt, iron sulphate, ferric oxide, sulphur, potassium iodide, copper sulphate	83·7	1·72	5·25	....	0·71	0·49	0·03	0·06	0·004	....	0·01		
Phosphate Cubes	168	Wesfarmers Hi-Efficiency	Westralian Farmers Co-op. Ltd.	Ground phosphate rock, pollard, cobalt chloride	....	18·0	15·0	....	....	....	....	....	50 ppm				
Concentrated Lick	178	Vic-Lic	Wilcox Mofflin	Bone char, ground limestone, cobalt chloride	....	24·3	49·2	....	....	....	....	....	0·0165				
Mineral Supplement for Cows	182	Hyco	Goldsbrough Mort & Co.	Potassium chloride, magnesium oxide, zinc sulphate, manganese sulphate, copper sulphate, sodium molybdate, sodium borate, potassium, iodide, iron sulphate, cobalt chloride	....	4·0	....	1,500 ppm	....	....	....	2,500 ppm	....	1,500 ppm	10·0	1,500 ppm	Nitrogen 6·0 Molybdenum 100 ppm Boron 50 ppm
Mineral Supplement for Sheep and Cattle	183	Hytel 2	do.	do. do. do.	....	6·0	....	4·0	1,000 ppm	....	1,000 ppm	12·0	0·5	7·5	15·0	8·0	Molybdenum Trace Boron Trace

* Minimum.

Stock Food	Applic. No.	Brand	By whom Registered	Materials from which Made	Registered Analysis											
					Sodium Chloride ($NaCl$)	Phosphoric Acid (P_2O_5)	Lime (CaO)	Magnesia (MgO)	Iron (Fe)	Sulphur (S)	Iodine (I)	Copper (Cu)	Cobalt (Co)	Manganese (Mn)	Potassium (K)	Zinc (Zn)	Other
					% (Max.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	%
C —Stock Licks—*continued* *5.—Mixed Stock Licks—continued*																	
Mineral Supplement for Pigs	184	Por-Co-Vite....	Goldsbrough Mort & Co.	Bone flour (digelatinised), bone charcoal, sodium sulphate (anhydrous), flowers of sulphur, salt, limonite, calcium carbonate, copper sulphate, cobalt chloride, potassium iodide	14·0	19·14	29·32	....	0·52	9·6	0·052	0·1	0·003	..	....	....	Sodium Sulphate 2·6
Sheep Pack	205	Min-A-Vit	Min-A-Vit Pty. Ltd.	Bone dust, talc, calcium carbonate, molasses, copper sulphate, zinc sulphate, manganese sulphate, cobalt sulphate, potassium iodide, vitamin D_3	5·0	17·24	33·69	2·85	....	....	0·042	0·099	0·037	0·030	....	0·020	Vitamin D_3 320 I.U./grm. Sucrose 8·839
Sheep Plus Pack	206	do.	do.	Bone dust, talc, calcium carbonate, molasses, copper sulphate, zinc sulphate, manganese sulphate, cobalt sulphate, potassium iodide, vitamins A and D_3	5·0	17·24	33·69	2·85	....	....	0·042	0·099	0·037	0·030	....	0·020	Vitamin A 475 I.U./gm. Vitamin D_3 320 I.U./gm. Sucrose 8·839
Orange Band	209	do.	do.	Bone dust, talc, whiting, salt, molasses, copper sulphate, zinc sulphate, manganese sulphate, cobalt sulphate, potassium iodide, vitamin D_3	21·0	18·0	22·0	2·0	....	....	0·043	0·025	0·009	0·032			
Orange Band Plus Pack	210	do.	do.	Bone dust, talc, calcium carbonate, salt, molasses, copper sulphate, zinc sulphate, manganese sulphate, cobalt sulphate, potassium iodide, vitamins A and D_3	21·0	18·0	22·0	2·0	....	....	0·043	0·025	0·009	0·032	....	0·022	Vitamin A 12,200 I.U./oz. Vitamin D_3 320 I.U./grm.
Red Band New Vitamin Formula	211	do.	do.	Bone dust, talc, calcium carbonate, salt, molasses, copper sulphate, zinc sulphate, manganese sulphate, cobalt sulphate, potassium iodide, vitamins A and D_3, iron oxide, vitamins B_{12}, E	16·0	12·0	18·0	6·0	0·625	....	0·043	0·025	0·009	0·032	....	0·022	VitaminD$_3$ 320 I.U./grm. Vitamin A 9,200 I.U./oz. Vitamin B_{12} 25 microgrm./oz. Vitamin E 8 I.U./oz.
Black Band	212	do.	do.	Bone flour, calcium carbonate, manganese sulphate, iron oxide, potassium iodide, salt, cobalt, sulphate, copper sulphate, vitamin D_3	15·0	27·0	40·0	....	0·077	....	0·030	0·0025	0·002	0·42	....	....	Riboflavin 130 mg./lb. Vitamin D_3 215 I.U./gm.

Vitamin Formula					ate, manganese sulphate, iron oxide, potassium iodide, salt, cobalt sulphate, copper sulphate, vitamins A, D_3 and K_3, calcium pantothenate													Vitamin A 1090 I.U./grm. Vitamin D_3 215 I.U./grm. Vitamin K_3 25 mg./lb. Riboflavin 130 mg./lb.
Min-A-Vit Pig Pack	214	do.	do.	Bone dust, talc, calcium carbonate, salt, molasses, copper sulphate, zinc sulphate, manganese sulphate, potassium iodide, ferrous gluconate, vitamins A, D_3, B_1, B_{12}, riboflavin, nicotinic acid	18·05	4·475	30·08	....	0·231	....	0·065	0·088	0·020	0·113	....	0·148	Vitamin A 304,350 I.U./lb. Vitamin D_3 156,500 I.U./lb. Vitamin B_1 121 mg./lb. Vitamin B_{12} 0·652 mg./lb. Riboflavin 130 mg./lb. Nicotinic Acid 986 mg./lb.
Rock Salt	216	Elders	Elder Smith & Co.	Salt, marl	95·0												
The Balanced Mineral Supplement	220	Stress	British Pharmaceuticals Pty. Ltd.	Bone, phosphate, potassium dihydrogen phosphate, magnesium sulphate, lactose, ferrous lactate, brewers yeast, manganese sulphate, potassium iodide	....	36·64	....	1·1	....	....	0·0016	....	....	0·003	8·9	....	Lactose 9·0
Tracalphos Hical	292	Terra	Terra Trading Co.	Lime, mineral phosphate, magnesite gypsum, copper sulphate, cobalt sulphate, zinc sulphate, sodium selenate, potassium iodide, aniseed oil	....	11·0	43·5	0·5	1,200 ppm	0·5	100 ppm	1,500 ppm	200 ppm	300 ppm	....	200 ppm	Molybdenum 300 ppm Fluorine 0·5 Selenium 30 ppm Aniseed oil, trace
Tracalphos Hiphos	293	do.	do.	Rock phosphate, gypsum, magnesite, copper sulphate, cobalt, sulphate, manganese sulphate, zinc sulphate, sodium molybdate, sodium selenate, potassium iodide, aniseed oil	....	34·5	43·0	1·0	5,000 ppm	0·5	100 ppm	1,500 ppm	200 ppm	300 ppm	....	200 ppm	Molybdenum 150 ppm Selenium 30 ppm Fluorine 1·5 Aniseed Oil trace
Ovatine for Fowls	301	B10	Biological Institute of A'sia Pty. Ltd.	Alstonia bark, ginger, faenugreek, ferrous sulphate, magnesium sulphate, potassium iodide, manganese sulphate, copper sulphate, cobalt chloride	....	....	....	7·30	5·87	....	0·05	0·4	0·03	2·19			
Vigomin	302	do.	do.	Malt flour, buttermilk powder, liver meal, charcoal, vitamins A, D_3, salt, sulphur, ferrous sulphate, bone flour	1·25	30·0	25·0	....	0·75	1·9	....	....	....	....	....	....	Protein 5·6
Mineral and Vitamin Powder for Pigs	303	do.	do.	Potassium nitrate, oil of aniseed, foenugreek, alstonia powder, limonite, copper sulphate, cobalt sulphate, calcium carbonate, potassium iodide, liver meal, vitamins A and D_3, riboflavin, bone flour	....	6·0	23·3	....	3·2	....	0·37	0·026	0·026	....	....	....	Vitamin A 44,500 I.U./lb. Vitamin D_3 4,450 I.U./lb.
D.C. (New)	304	do.	do.	Iron glycerophosphate, copper chloride, cobalt chloride, calcium glycerophosphate, ammonium molybdate, commercial hyrdochloric acid, water	....	2·92	1·75	....	....	....	0·37	0·085	0·014				

* Minimum.

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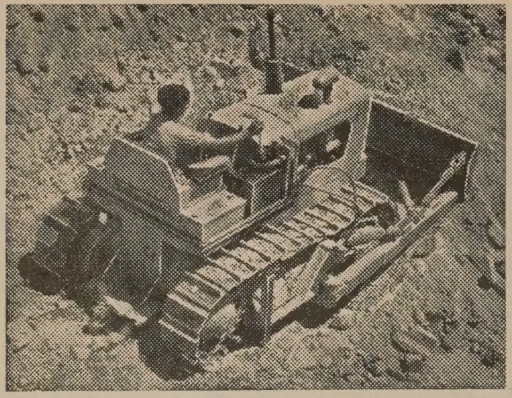

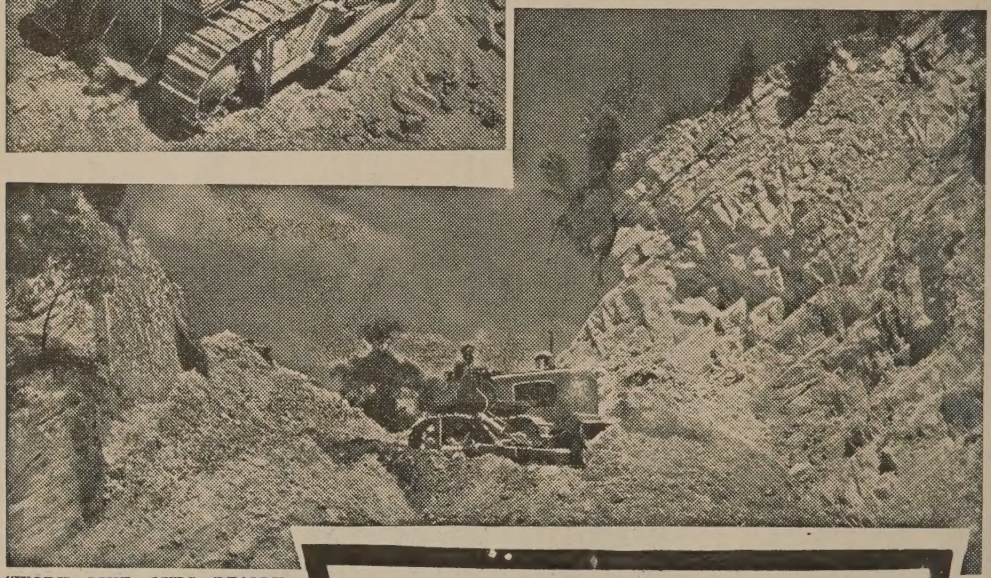

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PULLORUM-TESTED POULTRY FLOCKS 1960

EARLY in 1955, an amendment to the Stock Diseases Act made blood-testing compulsory for all commercial breeding and hatchery flocks of poultry, and it was required that the incidence of infection, as determined by the last test prior to the commencement of hatching, must be less than two per cent.

For the seven years 1948-54 when blood-testing was on a voluntary basis the average percentages of reactors were 5.43; 5.65; 5.95; 3.37; 2.53; 1.36 and 0.77 respectively.

The 1958 and 1959 tests each showed an average percentage reaction of only 0.18 per cent.—the lowest figure to be recorded.

The figure for the current season was 0.19 per cent. Only 244 reactors were found in a total of 129,336 birds tested and 31 of the 66 flocks tested were free of reactors. Only two flocks had to be tested twice.

The breeds of poultry in the various flocks are indicated by the following abbreviations:—

Australorp, A; White Leghorn, WL; First Cross, XB; Rhode Island Red, RIR; Light Sussex, LS; Black Leghorn, BL; Legbar, LB; Cambar, CB; Plymouth Rock, PR; Campine, C; New Hampshire, NH; various breeds VB; Meat Breed, MB.

Name and Address	Breeds	No. of Birds Tested	Percentage of Reactors
Adams, W. T., Bullsbrook	WL	3,404	0·21
Anderson, P., King Edward Rd., Osborne Park	A, WL	714	1·00
Angel, L., Mt. Helena	A, WL	1,981	....
Barker, G., Widgee Rd., Morley Park	A, WL	3,877	0·08
Barnett, T., Cowaramup	A	250	....
Bell, C. J., Grand Promenade, Bedford Park	A, XB, WL, MB	4,212	0·24
Bell, N. A., Abernethy Rd., Cloverdale	A, WL, RIR, XB	8,278	0·17
Bloomfield, H., Great Eastern Highway, Northam	A, WL, RIR	349	....
Carter, R. J. & N. H., Eva St., Maddington	WL	708	....
Catherall, W. H. & G. E. F., Taylor St., Maida Vale	A	705	....
Chalmer, H. & D., Acanthus Rd., Riverton	WL	1,901	....
Chalmer, F. E., Acanthus Rd., Riverton	A, WL	2,030	....
Charlton, A., Spring Rd., Kenwick	A, WL, XB	4,691	0·26
Cole, H., Division St., Welshpool	A, WL	1,799	....
Cook, W. A., Welshpool Rd., Welshpool	A, WL	2,708	....
Conlon, T., Troy St., Bassendean	A, WL	1,334	....
Dabelstein, E. T., Ypres Rd., Kelmscott	A, RIR	1,937	0·10
Dadley, M. H., Rockingham Rd., South Coogee	WL	1,149	0·17
Davey, A. E. & I., Eleventh Rd., Armadale	A	2,816	1·17
Davey, A. F. & R., Seventh Rd., Armadale	A	1,020	0·98
Davey, A. G. Mundijong	A, WL, RIR, VB	2,523	0·004
Dempster, F., Wanneroo Rd., Wanneroo	A, XB	693	....
Diamond Ice Co., Waneroo Rd., Wanneroo	MB	1,390	....
Fawkes, A., Wyatt Rd., Bayswater	A, WL, XB	3,610	0·61
Fenton, J., North Lake Rd., Melville	A, WL, RIR	4,289	....
Gardiner, C., Division St., Welshpool	A, WL, RIR	2,080	0·20
Gates, A. S., King Edward Rd., Osborne Park	A	1,913	0·50
Hampton, A., Scott St., Kewdale	A, WL, RIR	10,694	....
Hall, J., Wharf St., Queens Park	A	981	....
Hedges, J., President St., Kewdale	A, XB	1,752	0·40
Heggie, L., Wanneroo Rd., Wanneroo	A	2,731	0·55
Hill, R., Widgee Rd., Morley Park	A, WL, NH	1,530	0·13
Hickson, R., Amherst Rd., Swan View	A, WL	1,573	....
Hollings, F., Fulham St., Kewdale	A	363	....
Hoult, D., Kalamunda Rd., Maida Vale	A	1,627	0·70
Hugall, T., Kalamunda Rd., Maida Vale	A	889	0·45
Hunter Bros., Oats St., Kewdale	A, WL	1,613	0·49
Keene, K., Great Eastern Highway, Redcliffe	A, WL, NH	903	0·33
Kendall, L., Swan St., East Guildford	A, RIR	297	....
Kirwin, F., Nisbet St., Belmont	LS	28	....
Lindsay, —., May St., Kewdale	A	260	....
Miles, R., Wanneroo Rd., Wanneroo	A, LS, RIR, WL, XB, MB	5,084	0·31
McGregor, E. M., Uranium St., Kewdale	A	1,776	0·06
McIntyre, B., Todd St., Merredin	A, WL, LS, RIR	1,159	....
McAuliffe, K., Katanning	A	85	....
Oliver, R. E., Welshpool Rd., Welshpool	A, WL	1,776	....
Porter, R., Kingsway Rd., Wanneroo	A, XB	875	0·30
Porter, L. S., Narrogin	A, WL	2,037	0·25
Potter, S., Katanning	A	364	0·55
Pierce, P. C., Kenmure Ave., Bayswater	A, WL	242	....
Price, E. E., Macedonia St., Naval Base	WL	1,656	....
Reid, J., President St., Kewdale	A, WL, RIR, XB	1,093	0·18
Roberts, S. G., Cohn St., Carlisle	A, WL	2,947	....
Sears, G., Wanneroo Rd., Wanneroo	A, WL	1,768	....
Stevens, J. H., Swan St., Guildford	A, WL, RIR	1,369	0·44
Straw, F. & D. M., Adelaide St., Maida Vale	A, WL	1,092	0·37
Smith, J. T., Lionel Rd., Darlington	A	1,997	0·05
Tyler, A., Beechboro Rd., Bayswater	A, WL	1,490	....
Upson & Son, Pemberton	A, WL	2,355	....
Wexham Hatchery, Berkshire Rd., Forrestfield	A, WL, NH, RIR	709	0·40
Wear, R., Kew St., Kewdale	A, VB	130	....
Webb, G., Priory Rd., Maida Vale	RIR	146	2·05
Whittaker, G. E., Yale Rd., Kenwick	A, WL	3,877	....
Woodard, H., Hughes St., Canning Vale	A, WL	3,139	0·06
Woodard, L., George St., Queens Park	A, WL	2,575	0·35
Yates, A., Fulham St., Cloverdale	A, WL	1,993	0·25
Total	....	129,336	0·19

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